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ART. I.—REMARKS ON THE REVISION OF THE PHARMACOPŒIA.

By William Procter, Jr.

Previous to the year 1820 the medical profession in the United States had no authorized pharmaceutical guide, and the apothecaries no generally recognized standard for the preparation of medicines. The Pharmacopœias of the British Colleges were more looked to than perhaps any other, and the fact that these works varied in many particulars in the strength of medicines, and their mode of preparation, aided by the adoption of the one or the other of them in different localities, or by different individuals in the same place, gave to the pharmacy of this country, prior to the period stated, an irregularity and uncertainty hardly now to be appreciated, and it is to be hoped never to be again realized. As the medical community of Great Britain are beginning to perceive the impropriety of having three guide books for the apothecary within limits so contracted, they will doubtless, ere long, by the adoption of a National Pharmacopœia, avoid the reproach, of which the existence of strong local prejudices have rendered them deserving, and have an uniform standard for their pharmaceutical preparations.

The wisdom exhibited by the gentlemen through whose exertions the first edition of our Pharmacopœia was projected, and its publication accomplished, is every year more verified, and the provision then adopted for the decennial revision of the work they had produced, is one of the marks of their forecast. Two successive revisions have been accomplished, which have brought the work, on the scores of scientific exactness and simplicity of diction and arrangement, to a degree of perfection which enables it to be compared successfully with any of the European standards.

Until recent times the preparation and revision of Pharmacopœias devolved solely upon the physician, and was kept entirely within the pale of the medical profession. The revision of the French Codex in 1837 was conducted by a mixed commission of eminent physicians and pharmaceutists, who, by acting conjointly in carrying out their duties, have impressed on the revised edition of that work a character for accuracy in practical detail, not enjoyed by its predecessor.

The National Convention of 1840, appreciating the important part which pharmaceutists were qualified to act in this revisional labour, authorized the committee to whom they entrusted the revision of the Pharmacopœia, to invite the co-operation of the Colleges of Pharmacy in carrying it forward, (which invitation, so far as the Philadelphia College was concerned, received a hearty response in the form of a revision of the whole work by its committee;) and as a further mark of their respect, caused the adoption of a resolution, which places the incorporated pharmaceutical bodies of the United States on a footing with the medical institutions, by calling on them, in common with the latter, to elect delegates to represent them in the ensuing convention of 1850. Although the wisdom of this step, whatever our opinions as pharmaceutists may be, remains to be proven; yet it is believed that the pharmaceutical corps will cordially unite with their medical brethren in the accom-

plishment of the revisional labour which the convention of 1850 may entrust to their joint consideration and action, and will bring to their aid that practical knowledge of pharmaceutical operations so essential to the proper construction of formulæ, be they chemical or Galenical.

But of what avail, it may be asked, is the correct practical detail, the scientific accuracy, or the beautiful arrangement of a Pharmacopœia, if its provisions are not generally recognised and acted upon by those for whose government it is promulgated?

The vast extent of our country; the sparse and rapidly expanding population of the regions of the South and West; (which precludes the exercise of pharmacy in its more advanced state;) the local prejudices of different sections; and the absolute non-existence of any authoritative national or state legislation in its favour; are some among the many causes operating against the universal recognition and practical adoption of the precepts of the Pharmacopœia.

But there are other and more potent influences in action, which, by extending at the same time a knowledge of the Pharmacopœia itself, and of those sciences and principles upon which it is based, are gradually silencing the prejudiced, gaining new advocates, and consolidating a broad basis of favourable public opinion upon which to place the pharmaceutical superstructure.

Perhaps of the many causes which are conducing to this end, the United States Dispensatory and the American Journal of Pharmacy should be placed in the foremost rank. The former work, indeed, by its very general adoption, and from the fact that the second or pharmaceutical portion of the book may be considered as a commentary, or exposition of the Pharmacopœia, has done more than any other agent. Its enlightened authors, by their talent and research, have rendered it so replete with information on all subjects connected with pharmacy; and in their full digest of the processes of our national work, as compared with other stand-

ards, have placed the former in so favorable a light; that the adoption of its formulæ is becoming more and more general wherever the Dispensatory is known, which may be said to be everywhere in the United States, where the preparation of medicines is in the hands of the regular apothecary or the junior practitioner.

The American Journal of Pharmacy, by its constant advocacy of the authority of the Pharmacopœia, by its steady adherence to an elevated tone in upholding and illustrating those scientific principles, without which pharmacy is mere empyricism, and by acting as the organ of presentation of most of the new remedies which are constantly arising at home and abroad; has undoubtedly done much in the cause of pharmaceutical reform.

The Colleges of Pharmacy should also be adduced; particularly the Philadelphia and New York colleges. The former, the oldest pharmaceutical institution in the country, by her many graduates scattered over the Union, imbued with a knowledge of sound principles of pharmacy, is constantly extending her influence and advocating the cause of the National Standard.

The hundreds who annually resort to the medical schools of this and other cities, become necessarily acquainted with the precepts of our Pharmacopœia, and, in retiring to their future homes, whether these be in the rising cities and towns, or the secluded vallies of the distant West and South, they will adopt them in their practice, and respect the authority from which they emanate.

And, finally, the spirit of the age, as exhibited in the eager adoption of rapid means of communication by steam and electricity, by familiarizing each section of the Union with the others, by the constant intermingling of their citizens, and by the rapid circulation of ideas, is altogether in harmony with the existence of a universally acknowledged Pharmaceutical Code.

As six years of the ten which separate the last revision

from the one ensuing have elapsed, it may be asked what has been done by those most concerned, in preparing for that event? What processes have been found imperfect? What formulæ incorrect? What officinal substances useless, or what new remedies worthy of introduction discovered? The period which yet remains should be distinguished with the gradual but complete evolution of the answers to these queries, so that the duties of revision, onerous as they are, under the most favourable circumstances, may be facilitated and lightened.

It is much to be desired, that the next edition of the Pharmacopœia may be national in detail as well as in name; that its provisions may be sufficiently comprehensive to embrace the well grounded pharmaceutical preferences of different sections, when these are not incompatible with that unity of design and scientific propriety, which should be marked features of a work issuing from so dignified, and learned a body, as it is presumed the convention of 1850 will be. In order to accomplish this, some means must be resorted to, to enable the revisors to appreciate the opinions of all sections of the Union. It is with a view to this general expression of sentiment, so far as pharmaceutists are concerned, that this essay has been written, hoping that some of its hints may be of service in pointing out a course.

Dr. David Stewart (late pharmaceutist,) of Baltimore, than whom no one has more enlightened views of our profession, or a keener desire for its advancement, has suggested the propriety of a Pharmaceutical Convention, to meet in Philadelphia prior to the next revisional epoch, which shall represent as many sections of the country as possible; in order that a comparison of the general views might be obtained. To render the plan feasible, he suggested that the delegates from great distances should be constituted of those pharmaceutists who annually resort to Philadelphia, New York, &c., in the pursuit of their business, and who would come possessed of the sen-

timents of their respective neighbourhoods on the merits of the Pharmacopœia.

If this plan was carried out with spirit, it would undoubtedly be attended with good results; but unfortunately for its success, the gentlemen who resort to our marts are generally too much occupied with their private business; take too little interest in the subject; or from their representing in many instances the wholesale dealers rather than the apothecaries, might not be qualified for the necessary judgment in the case—which requires a knowledge, not merely of what drugs are most employed in this or the other section, but what processes do not yield products of a satisfactory character, or what formulæ of great admitted value have not found a place in the work.

It is the opinion of the writer that a much more general expression would be obtained, and in a form more conducive to the end in view, by the following course:—

It is presumed that in every city or town which contains ten or more apothecaries, there exists a pharmaceutical public opinion, which shows itself in an analogy of sentiment in regard to certain preparations, or the Pharmacopœia in general, and which embraces to a certain extent the views of the practitioners of medicine in the same locality. As these cities or towns are resorted to by country physicians for their supplies of medicines, they necessarily come in contact with the apothecaries, who thus extend their influence far beyond their immediate neighbourhoods, and such cities or towns become Pharmaceutical *centres* of more or less importance. If, therefore, one or more of the most intelligent pharmaceutists of each of these *centres* would open a correspondence with some general *centre of record*, giving the views of his colleagues on any imperfections of the existing Pharmacopœia, or on any suggestions tending to its improvement, a mass of information would be obtained, embracing the united expression of the profession.

If such a course was pursued, its effects on the Pharmacopœia, however beneficial, would be but secondary to its results on the state of pharmacy throughout the country. In many of the cities and towns of France, it is common for the apothecaries to form societies for their mutual benefit and improvement, which associations embrace the possession of a library, a laboratory, and sometimes a botanical garden, but generally without a school of pharmacy. This is a course well worthy of the attention of American pharmacentists, if adopted in places like Pittsburg, Cincinnati or St. Louis, Charleston, New Orleans, Albany or Buffalo. Associations of this kind, having for their object the elevation of the profession and the improvement of its members, by the establishment of libraries, embracing works on Pharmacy and the accessory sciences, (including some of the best periodicals, both foreign and domestic,) to which might be added, in process of time, a laboratory for the use of the members—and by encouraging correct principles and discouraging empyricism—would be productive of lasting benefit, and would create in each place an *esprit du corps*, that would manifest its existence in a question like the one under discussion, by calling forth a degree of respect proportioned to the tone of proceedings it originated. I know it will be said that petty jealousies and the restless pursuit of wealth would interfere with the formation or existence of societies, which in their nature would be to a greater or less extent the censors of their neighbourhoods. Be it so;—it is an additional motive for their establishment; and if twenty or ten will not join, let five commence the good work, for they will be amply rewarded in the end. The amount of funds which five individuals will be able to subscribe, though small, and perhaps inadequate to the possession of a place of meeting with its accompaniments, would be amply sufficient to purchase a set of the most approved pharmaceutical and chemical works, and to subscribe to some of the best scientific periodicals bearing on the pro-

fession. The annual accumulation of these would form the nucleus of a future library, and perhaps be the humble means of inciting efforts for self improvement, the results of which may not be confined in their utility by the boundaries of our country, or the waters of the Atlantic. Our journal would then avoid the reproach to which it is sometimes obnoxious, of being a mere reprint of foreign periodicals, and with the increased number of zealous observers, not only would *it* rise in character and importance, but similar publications would originate in other localities, bearing on their pages the impress of scientific acquirements of a respectable order.

But to the object in view. It is hardly probable, in the short time which will elapse before the next revision, that much local change will be effected in the way suggested, even if the parties should concur; but it lies in the power of every apothecary or physician who may have improvements or criticisms to offer, to contribute something towards the work in his individual capacity, by presenting his views in a communication to this journal; which from its central location, general circulation, and as being the only purely pharmaceutical organ in this country, is peculiarly fitted for the object. If such a course were adopted and pursued during the four ensuing years the whole ground of the Pharmacopœia might be gone over, and a fund of useful hints and suggestions collected ready for the action of those, to whom the Convention of 1850 shall delegate the revision.

Whilst on this subject it may be apposite to observe, that in one important feature the Pharmacopœia of 1840 differs from its predecessors, viz.: in the employment of the method of displacement in the preparation of certain vinegars, extracts, syrups, tinctures and wines. Inasmuch as the introduction of this method into pharmaceutical operations was of recent date, and a knowledge of its application by no means general, the revisors of the Pharmacopœia, whilst

they adhered to the old mode, by maceration, have appended, in many of the instances where it was applicable, an additional formula, in which the substance or substances are exhausted by the displacement process. The wisdom of this step must be apparent to all who reflect on the subject. The intrinsic merits of the new process were too palpable to be disregarded; on the other hand, a knowledge of its right application, or, indeed, of the method at all, was too limited to trust to its exclusive adoption, even in those cases where its superiority was beyond question. Its presentation in the Pharmacopœia is an endorsement of its value, and doubtless, hundreds who otherwise never would have known or employed it, have thereby been induced to try its capabilities.

In the natural progress of things, the unconditional adoption of this method in those cases where its *utility is beyond a doubt*, may be looked to as one of the features of the next edition of the National work. Ten years *pupilage* will have afforded ample opportunity for the apothecary to test its value, and it is very much to be desired that every pharmaceutist within our national borders will acquaint himself with it by practice, to enable him at least to judge of its merits. There ever will be those who rebel at all innovations, however beneficial; who discard every amelioration, be it ever so improving, and who, clinging to antiquity as the test stone of their profession, look with distrust and doubt upon all recommendations which tend to overturn their accustomed ideas and practice. To these the process of displacement will remain as a sealed book; but to that class who are impressed with the yet imperfect state of Pharmacy in the United States at large, and to the rising generation of pharmaceutists, it is open, and it is to be hoped that their interest in it will not abate until every formula in which it is applicable be demonstrated beyond question, and those cases where it is inappropriate be well ascertained and exposed.

ART. II—OBSERVATIONS ON PHOSPHATE OF AMMONIA.

By Charles Ellis.

We are indebted to Dr. T. H. Buckler, of Baltimore, for an interesting communication on the use of Phosphate of Ammonia, in gout and rheumatism. The theory of Dr. B., in regard to its remedial action in those diseases, the reasons which induced his experiments, together with a history of the successful treatment pursued by him, will be found in the article alluded to, published in "The American Journal of the Medical Sciences" for January, 1846.

Before proceeding with our remarks upon the chemical character of this salt, and the methods of preparing it, the introduction of which, as a new remedy, by Dr. Buckler, is another contribution from the science of Chemistry to that of Medicine, we propose to make a few extracts from his Essay which will throw some light on the history of the introduction of this salt to the class of the therapeutic agents:

"My attention was called particularly to this subject quite accidentally, and in this way. A gentleman of high intelligence, great acuteness of mind, and a subject of gout, came under my care, in an attack of this disease. Some days after my visit to him had ceased, he addressed me a note in which he complained that his finger joints, which had been for a long time thickened, were more swollen than usual, and that since his last attack they were quite sensitive, so much so as to give him great uneasiness. He further remarked, that, in reading the life of Lord Eldon, he had seen it stated that he, (Lord Eldon,) had been sent, while suffering from an attack of gout, to drink the Bath water, the effect of which was instantly to cut short the gouty paroxysm. He begged me to send him an analysis of the Bath water, and asked, at the same time, if there

was not some agent known to physicians, which would neutralize the matter of gout.

"I wrote him in reply, that gout and rheumatism were the opprobria of medicine. That Lord Eldon might just as naturally have gotten rid of his gout had he gone to any other place than Bath, and that because Lord Eldon had been cured by the use of the Bath water, it by no means followed that the same remedy would relieve him. That we knew of no solvent which would deprive the fluids of the matter of gout; that this had long been a desideratum with physicians, and that there was no doubt that the investigations which were now being made by chemists would shed such light upon the disease, that we should not be very long without a suitable and philosophical mode of cure; information which, in an hereditary point of view, might have been very consolatory to his children, but not likely to prove so to him.

"Fearing lest my patient might think that the difficulty lay not in the science of medicine, but in his physician, I sent him an analysis of the Bath water, and with it all the treatises on gout which I had in my possession, in order that he might see for himself how contradictory the observations and statements of experience were in regard to it. And now having been forced to this confession of ignorance on my own part, and on that of the profession generally, I begged, in conclusion, to reassure him of the hope entertained by some that the day was not far distant when we should have a direct solvent of the matter of gout. How far my expectations have been already realized, remains to be seen."

"During, and after an attack of either of these diseases, thickening often takes place in the fibrous and cartilaginous tissues. In gout this thickening most generally occurs in the small joints of the fingers and toes: but in rheumatism it is oftener seated in the larger articulations, and about the valves of the heart, and, when chronic, often converts the

fibrous tissues into fibro-cartilage, and cartilage into bone. And where chemists have examined these structural thickenings, they have found a variable abnormal per centage of earthy matter, consisting for the most part of soda and lime. Both diseases are frequently associated with what is called the uric or lithic acid diathesis; that is to say, when a man has a gouty or rheumatic habit, it is generally found that lithic acid is in excess in the secretions of his skin and kidneys. When an individual labours under an acute attack of gout or rheumatism, his recovery is generally heralded by a redundant deposit of lithic acid in his urine. This harbinger of a favourable termination to the disease may happen on the second day of his attack, or on the sixth week, as may be; but whenever it does appear, it may very safely be said that the patient is convalescent.

"By what mode this acid is eliminated, or what accident it is which determines its separation, we are unable to say; it stands merely as an isolated fact that by some chemical or vital change taking place, uric acid is separated in great quantity and the individual is relieved. The urine in the course of such an attack may be examined and found as clear as water, and the fluid passed ten or twenty hours after, so loaded with lithic acid as to resemble the washings of a wine cask or beer barrel. From whence is this enormous quantity of lithic acid so suddenly derived? Not from any sudden defect of assimilation occurring in the course of the disease, or from the solids of the body. It is most likely then derived from the blood; but uric acid cannot have existed there in a free state, or it would have been passed from day to day. If then it existed in the blood, it must have been in some state of combination with soda, or lime, or both. And this is the more likely, when we reflect that the concretions and thickenings which take place in the fibrous, cartilaginous, and white tissues generally, as before stated, are owing to the deposit in them of soda and lime in variable proportions with lithic acid. Taking into

account these two prominent facts above stated, namely, the excess of lithic acid found in the urine at the period of convalescence from an attack of acute gout or rheumatism, and the subsequent deposit of soda and lime in the white tissues, it occurred to me, that, during the existence of these diseases, the lithic acid might exist in the blood in a state of combination with soda and lime in the form of insoluble compounds, which the kidneys and skin refuse to eliminate. If then any agent could be found capable of decomposing the lithates of soda and lime existing in the blood, and of forming in their stead two soluble salts, which would be voided by the kidneys and skin, we should thereby get rid of the excess of fibrin in the blood, the symptomatic fever and the gouty and rheumatic inflammation, wherever seated, which have been excited by the presence of these insoluble salts. It occurred to me that *phosphate of ammonia* might be the agent, provided it could be given in doses sufficient to answer the end without producing any unpleasant physiological symptoms. If our theory were true, phosphate of ammonia seemed to be the proper reagent, for it would form in place of the insoluble lithate of soda, two soluble salts, the phosphate of soda, which is remarkably soluble, and the lithate of ammonia, which is also soluble, and both capable of being readily passed by the skin and kidneys. The excess of uric acid would thus be got rid of in the form of lithate of ammonia; and the soda, floating in the round of the circulation, (instead of being deposited, as it were, like an alluvial formation in the substance of the fibrous and cartilaginous tissues,) would be taken up by the phosphoric acid and eliminated from the circulation. Based on this theory I determined to try this salt, and it was not long after that a favourable opportunity presented itself."

Since the publication of Dr. Buckler's paper, phosphate of ammonia has ceased to be known only to the chemist, and has become one of "the new remedies." If time shall

establish its character, and confirm the experiments which have thus far been made, it will no doubt be added to the list of officinals in the next edition of our National Pharmacopœia.

This salt is readily prepared by the direct union of phosphoric acid and ammonia, with which it forms three combinations, containing one, two, and three equivalents of ammonia. The first salt is composed of one equivalent of acid, one of ammonia, and two of basic water; the second salt of one equivalent of acid, two of ammonia, and one of basic water; and the third salt of one equivalent acid, three of ammonia, and no basic water, being salts of the tribasic phosphoric acid in which the basic water is partially or wholly displaced by ammonia. The first mentioned salt is called by some authors the biphosphate—the second salt, the neutral phosphate, and the third salt the subphosphate. It is the second salt or neutral phosphate that it is designed to employ as a remedial agent.

Of the two methods for obtaining phosphoric acid—by the action of nitric acid on phosphorus, and by the decomposition of calcined bones—the latter is preferred on account of its safety and cheapness. The following is the usual formula, viz:

Take of Bone burnt to whiteness and powdered 10 lbs.
Sulphuric acid 6 lbs.

Mix them in a stone-ware vessel, and add one gallon of water—digest for three or four days, frequently stirring, and add a gallon of boiling water—strain through linen, gradually adding more boiling water until the liquid passes without much taste. The sulphuric acid acts upon the lime of the bone-earth, effecting a partial decomposition, the greater portion of its phosphoric acid is liberated, which acts as a solvent for the remaining portion of bone-earth, and remains in the strained liquor as a superphosphate of lime contaminated with a portion of sulphate of lime. The acid solution is concentrated to one gallon, and, by cooling, deposits the sulphate

of lime. The supernatant fluid is then saturated with carbonate of ammonia, which combines with the excess of phosphoric acid, and precipitates the phosphate of lime which it held in solution, and the filtered liquor, after concentration by a gentle heat, is set aside to crystallize.

The evaporation of the solution should be conducted at a very low temperature, which at no time should exceed 100° Fahr., and for this purpose the drying room heat is perhaps the most favourable. By spontaneous evaporation the salt is obtained in more regular and larger crystals; and where time is no impediment, that mode of isolating it adds much to the beauty of the product. The necessity of using a low temperature is owing to the extreme readiness with which the neutral phosphate parts with one half of its ammonia, and assumes the state of acid, or bi-phosphate, which change, besides diminishing the product, unfits the salt in great measure for producing the therapeutic effect required of it. After removing each crop of crystals, it is necessary to concentrate the solution, and to add more ammonia, so as to crystallize from a neutral or slightly alkaline solution.

Neutral phosphate of ammonia crystallizes in square prisms, terminated with four-sided pyramids, with the apex truncated. Crystals of the alkaline phosphate, which assumes the form of six-sided plates, derived from the rhombohedron, are frequently found mixed with the neutral salt. It should be observed that the solution requires to be decolorized with animal charcoal before being placed aside for crystallization.

It has been suggested that oxalic acid, if added to the solution of super-phosphate of lime, would by its superior affinity for lime throw down that earth, and thus increase the amount of phosphoric acid in the solution capable of uniting with the ammonia. We have not had an opportunity of testing its power by experiment, and hence cannot recommend its use, but we believe, even if it should enjoy that property, its price, added to the danger of con-

taminating the product, will be good reasons for avoiding its use.

For the process for obtaining phosphoric acid from phosphorus, the reader is referred to the United States Dispensatory, art. "Acidum Phosphoricum Dilutum" of the London College. According to the experiments of George W. Andrews, chemist, of Baltimore, one pound of phosphorus yields three and a half pounds of phosphate of ammonia, which is less than the theoretical quantity, owing, no doubt, to the loss of material during the oxidating process.

It may be as well to state that the usual formula for the administration of the phosphate is as follows, viz:

℞ Ammoniæ phosphatis, . . . ℥ss.
Aquæ, ... f.℥vj.
M. ft. solutio.

The dose of this solution is a table spoonful three times a day for an adult.

ART. III.—PHARMACEUTICAL NOTICES.

By Augustine Duhamel.

Laudanum, with and without Narcotine.

Opium in the form of alcoholic tincture is of such high importance as a remedy in popular use and estimation, that I feel that any observations respecting its mode of preparation, differing from the present observance to "*authority*," must be regarded by some as a useless innovation. Nevertheless, the experience I have had, and the satisfaction consequent upon the good results of preparing and vending laudanum freed, almost, if not wholly, from *narcotina*, the noxious principle of opium that occasions all the distressing

symptoms*—induces me to call the attention of such as are unacquainted with this process to its superior advantages.

Our U. S. Pharmacopœia directs us to macerate a portion of opium, first dried, and then reduced to powder, in a certain quantity of diluted alcohol, for the space of fourteen days, at the end of which time it is to be expressed and filtered. This is then a solution containing all the active, including the bad as well as the good, and also much of the inactive principles of opium—and hence unsuited to the idiosyncracy of many patients, and for administration in large doses, when a sedative and not a narcotic influence is required.

In the desire to separate these and employ a solution of the good and efficient properties only of opium, many preparations have been devised as substitutes, having for their base morphia. A preparation much in vogue at the present time, and known as McMunn's Elixir of Opium, is believed to be a solution of meconate of morphia, obtained from a

* With respect to the action of narcotina, the prevailing opinions may be learned from the following extract from Pereira's Elements of Materia Medica. "When narcotina was first discovered, it was said to be the stimulant principle of opium, and Majendie states, a grain of it, dissolved in olive oil, produced the death of a dog in twenty-four hours, while twenty-four times this quantity was given, dissolved in acetic acid, with impunity. Orfila, at one time, declared it was inert, then, that it acted like morphia, and subsequently that its operation was remarkable and peculiar. Bally asserts that, in a solid state, it is inert, for 129 grains may be given at one dose, without exerting any obvious effect. The truth is, I believe, that narcottna possesses but little activity, and I presume, therefore, that the first experimenters with it employed an impure substance. Dr. Roots gave gradually increased doses of it up to a scruple, without the least injury. The bitterness of its sulphuric solution led him to employ it in intermittents, as a substitute for disulphate of quina. More recently, attention has been drawn to it in India, by Dr. O'Shaughnessy (*Brit. and For. Med. Rev., Vol.* viii. p. 263,) as an Indian indigenous substitute for quina, and nearly 200 cases of intermittent and remittent fevers, treated by it, have been published."—Ed. Amer. Journ. Pharm.

cold infusion of opium, to which wine has been added in sufficient quantity to ensure its preservation. The fact of its being given in large doses without producing any unpleasant symptoms whatever, is ascribed to its not possessing any *narcotina*. A denarcotised laudanum, formed of opium, from which the narcotine had been isolated by maceration in ether, has long been known, and its pleasing qualities advocated by many medical writers. At one time it so far claimed the attention of chemists, as to induce Prof. Hare of the University to prepare a quantity of it, portions of which he distributed among our apothecaries, in the view to have its virtues made manifest, and at the same time elicit for it a preference over ordinary laudanum. This is, however, an expensive preparation, from the quantity of ether wasted—opium itself being a dear drug; consequently very little heed has been given to the making of denarcotised laudanum; but when the fact becomes more extensively known, that simple water can supply the place of the ether, we may then look for its more general adoption. The method I pursue in making laudanum, taught by my eminent instructor, and at present pursued by some of my colleagues, is first to divide the opium as finely as possible, (either by bruising in a mortar, if dry—or cutting in small pieces, if moist,) and macerate it in a quantity of water sufficient to cover it, during twenty-four hours: it is then expressed forcibly through a cloth, and the marc malaxated with the fingers, so as to reduce the coherent particles, and again subjected to the action of an equal quantity of cold water; and after being allowed to macerate for a couple of hours, is again put under the press and the liquid parts extracted; the residuum is then placed in a mortar and rubbed down by means of a small quantity of water and some fine sand, to a pasty consistence, then transferred to a funnel, and water added until the quantity requisite to form half of the menstruum is made up from percolation; to this aqueous solution add the alcohol, and set aside for some

time to give the benefit of the colour to the alcohol, which it takes from the finely diffused extractive;—lastly, filter through paper. In the process here employed we have a solution containing the whole of the meconate of morphia and codeia, whilst the narcotina, resin, caoutchouc and ligneous matters are left behind.

The principle of displacement applied to opium has been very properly objected to, in the apprehension that carelessness or want of skill in conducting the percolations might occasion great disparity in the results; yet in experienced hands, and managed with the proper care, the witness can perceive the beauty and efficiency of the *principle*, in enabling the operator to exhaust the marc of opium, not only of colour, but of odour and taste.

Chemical authority might be given here for the statement that the narcotina is wholly separated by these means; but as others equally good speak of a portion being taken up by the meconic acid in union with the morphia, I made an experiment to test the fact.

Four ounces of laudanum, thus prepared, were evaporated to dryness, and the gummy extract then digested in ether at 80° F. for twenty-four hours, during which time it was occasionally raised to the point of ebullition; the ether, which underwent no change in colour, was then decanted and suffered to evaporate; ere this was wholly accomplished, a slight crystalline deposite was observed upon the side of the vessel, and by the action of nitric acid and sesquichloride of iron, proved to be narcotine, mixed, however, with resinous matter. The weight of both was a little more than one-third of a grain.

Having on hand some aqueous extract of opium, prepared by an eminent house of this city, I essayed 150 grs. in the same manner, but without obtaining the least evidence of narcotina. The ether became colored yellow, and after evaporation left a dark viscous extract with traces of a fixed oil. This may have been prepared from opium

analogous to that collected in France, and described by Pelletier as containing *no narcotina.* I find no mention made of the average proportion of narcotina in good Turkey opium. From experiments made by Dr. O'Shaughnessy upon upwards of fifteen different specimens of India opium, he found the per centage to vary from three-fourths to six per cent.

A Method of Writing upon Glass.

M. Simonin, of Nancy, has suggested an easy method of engraving divisions, letters and unalterable characters upon glass, for the use of chemists and apothecaries. It is as follows: Spread with a soft brush a coating of engraver's varnish upon the bottles or tubes you would use; when dry, trace your letters with a pointed instrument, so as to remove the varnish; over these places spread a moderately thick coat of a soft paste, made extemporaneously with powdered fluor spar and strong sulphuric acid. After several hours of contact, wash it, and the glass will be found sufficiently corroded. For the formation of indelible marks for labelling purposes, the action may be rendered more energetic by covering the paste over with a piece of sheet lead.—*Journ. de Chim. Med.*

I have tried the above given method with the most satisfactory result. I would recommend, however, a coating of wax instead of varnish, as tending better to preserve the glass from being acted upon, except in the parts exposed.

The action of the paste during the space of eight hours, produced well defined lines, as strongly marked as though done with a file; five minutes time gave a very perceptible impression. A. D.

ART. IV.—AN ESSAY ON ALCOHOLIC TINCTURES.*

By M. Jaques Personne.

We designate by the term alcoholic tinctures, solutions in alcohol of the principal medicinal principles contained in vegetables and animals.

In these preparations, alcohol is almost always employed to hold in solution medicinal substances, and to preserve them from change. They are, therefore, medicines in which practitioners ought at all times to find the active principles, if not in the same state as they are met with in the vegetables themselves, at least in a perfect state of preservation.

The active principles that enter into the composition of tinctures are of a different nature, according to the substances by which they are furnished; some, as we know, are more soluble in concentrated alcohol, as the resins; others are, on the contrary, more soluble in weak alcohol, or in water; as, for instance, the gum resins and extractive matter. From thence arises the necessity of employing alcohol of different degrees of strength to dissolve these substances, regulated according to the medicinal principles the substances on which you operate contain.

The various degrees of strength of the alcohol, intended for the preparation of tinctures, have been chosen in a manner purely theoretical. In fact, when analysis has shown that the active portion of a substance is soluble in concentrated alcohol, we prescribe alcohol of this description in the preparation of the tincture; on the contrary, if it

* The importance of the information sought after in this essay was so well appreciated by the Societé de Pharmacie, that they offered their prize of 1000 francs for the best essay in answer to the queries they propounded. The above paper of M. Personne received the prize.—*Ed. Am. Journ. Pharm.*

is proved that the active principle is more soluble in weak alcohol, the preference is given to the latter. In the case of substances on the nature of which analysis has not yet decided, the strength of the alcohol has been chosen, in a manner that is almost empirical, basing it always upon analogy.

Relying upon these facts, the "codex" has adopted alcohol of three different degrees of strength for the preparation of tinctures; these degrees are 36°, 32° and 22° of Baume or 86°, 80° and 56° of the centesimal scale. Alcohol at 86° is reserved for substances which are loaded with fat and little soluble substances. Alcohol at 80° for substances containing various resinous principles and volatile oil, and lastly, alcohol at 56° for substances of an extractive nature.

Are these three different degrees of strength which are recommended, the most fitted for the preparation of alcoholic tinctures? several isolated experiments have thrown a doubt upon this first point.

The intention of alcoholic tinctures is also to provide practitioners with solutions of a known strength, that they may be able to calculate the relative proportion between the quantity of the tincture prescribed, and that of the substance used in its preparation.

The extremely varying nature of the vegetable and animal substances used in the preparation of these medicaments, cause us to imagine, in the very onset, that the same quantity of the vehicle cannot be sufficient to dissolve, entirely, all the principles contained in each of these substances: in that case the proportion of the alcohol ought to vary according to the quantity of soluble matters contained in the substances employed. But as it is useful that practitioners should easily remember these proportions, different authors all agree to admit but a small number. On this account the "codex" prescribes, in most cases, the proportions of four parts of alcohol for one part of the substance employed.

Are these four parts of alcohol sufficient to extract the whole of the active principles of the animal or vegetable substance employed, or does not a certain quantity of these principles remain in the substance, not being able to enter into solution in the alcohol, on account of the small quantity of that vehicle? In the first place the proportion between the alcohol and the substance employed would be correct; in the second, this proportion would not be correct; and the result of this uncertainty would be that, if the practitioner should prescribe any particular dose of a tincture, he would not know how much of this tincture represented the substance employed in its preparations, how many parts it contained of the vegetable or animal matter in the solution, and consequently he would not be able to judge with certainty of its effects.

The first, and I should say the only attempts known for determining the real strength of the alcohol, as well as the proportional quantity to employ in the preparation of tinctures, were made in 1817, by Messrs. Cadet and Deslauriers.*

The process these able pharmacopolists employed, and which they have laid down as the best means of arriving at results as exact as possible, is divided into two distinct operations.

The first consists in completely exhausting a given weight of each substance, previously dried in stove, by maceration in cold alcohol at 36° Baume; the reduction in the weight of this substance indicates the quantity of matter dissolved by the alcohol. In performing the same operation with distilled water, we obtain the proportions of matter dissolved by the water and the alcohol, separately, and we ascer-

* (*Journ. de Pharmacie, Vol.* 3, *p.* 402.) I ought, however, to mention the attemps to attain the same end, made by M. Masson-Four, (*Bulletin de Pharm, Vol.* 1,) and those of M. Coldefrey, (*Journ de Pharm, Vol.* 2.) which consisted in exhausting the substances on which they operate, by macerating them several times in hot alcohol, &c., but time and practice have proved that the end did not justify the means.

tain, according to these authors, the quantity of soluble matter in a given weight that any substance can furnish.

These points being ascertained, we must have recourse to a fresh operation to determine the relative quantity of the two vehicles necessary to hold in solution all the soluble principles. These operations consist in preparing saturated tinctures, by macerating the substances you wish to operate upon in the smallest possible quantity of alcohol at 36° B., filtering and evaporating a determinate weight of the tincture, to ascertain the quantity of matter held in solution, to repeat the same operation with distilled water; then to discover the quantity of alcohol necessary to dissolve a certain portion of the extract obtained by the alcohol, and to repeat the operation with water and the extract obtained by that solvent. It will be sufficient then to multiply by the quantity of the extract furnished by the substance, the quantity of each liquid necessary to dissolve an aliquot part of the extract, to obtain the proportions of alcohol and water, the mixture of which would be proper for the preparation of the tincture.

This process, ingenious as it is, is nevertheless not exact, for it rests upon a principle, the proof of which is far from being proved—a principle, which, in the generality of cases, is even false.

In fact, it is not correct to say that if we macerate separately in alcohol and water a substance containing resinous oily matters, and with extractive and gummy substances, we dissolve, by means of alcohol, all the matter soluble in that liquid that the substance contains, and that it is the same in the case of water. For, in order that that might be true, it would be necessary that these matters, of a nature so distinct from each other, should exist in the vegetable in a state of complete separation.

Is it not; on the contrary, more reasonable to imagine that these substances are in a nearly complete state of combination, and, that, being thus combined, they are not separated by the separate action of each solvent? It is only in this

manner we can explain the difference of the results at which I have arrived in the case of several substances, as we shall see in the account of the experiments I shall presently mention.

Thus, therefore, no sufficiently correct experiments exist to legitimatise the three degrees of strength of the alcohol recommended by the "codex."

Neither is there anything that enables us to ascertain precisely whether the relative quantity of alcohol recommended is sufficient to dissolve, entirely, the active principles of the substances submitted to its action.

It is for the purpose of removing the obscurity that exists on these two principal points, that the *Société de Pharmacie* has mooted the following two propositions to "ascertain by precise experiment what is the most proper strength of alcohol for the preparation of alcoholic tinctures."

"What is the relative quantity of alcohol necessary to dissolve the medicaments most generally employed?"

If the numerous experiments I have made do not lead to a definite conclusion, and perhaps we may give the present state of science as the reason, they will at least serve, as I believe, to dissipate to a great extent the obscurity that exists in the preparation of alcoholic tinctures, and decide definitely, in the case of a great number of them, the proper strength of the alcohol as well as the necessary proportion of that liquid to dissolve under the most favourable circumstances, and the most completely, the active principles of the substances used in these preparations.

These experiments are of two kinds:—1. To ascertain if the proportionate quantity of alcohol employed at the present time is sufficient to dissolve entirely, or at least as nearly as possible, the principles contained in these substances, or otherwise; and to discover what is the best proportion to employ. 2. To ascertain, also, the strength of alcohol most fitted to dissolve the active principles of these substances.

To determine the quantity of alcohol necessary, our aim must be to macerate with different quantities of alcohol, then to collect the whole of the tincture, and submit it to evaporation; or for the purpose of ascertaining the weight of the diminished matters. My first intention was to employ expression to extract the tincture, but I was soon convinced that that method was insufficient; the same operation repeated several times with the same proportions of the solvent and the substance, gave me results that differed too greatly. In fact, it is impossible so to regulate the pressure that it may be the same in all instances; in that case, there remains in the residuum a larger or smaller quantity of the tincture, and consequently of the principles; which have, nevertheless, been dissolved by the alcohol.

The following is the process on which I decided, a process which was pointed out, however, in the programme of the prize proposed by the *Soécité de Pharmacie*, and which is certainly the best means of arriving at correct conclusions.

A determinate quantity of the substance was macerated for a fitting time in a given proportion of alcohol; the maceration being completed, the whole was thrown upon the filter, the amount of the filtered tincture was carefully weighed, and then evaporated in a sand-bath; then the extract obtained was dried in a stove heated to from 158° to 174° until it no longer lost weight. The weight of this extract deduced from that of the evaporated tincture, gave me the weight of the alcohol contained in that portion of the tincture: simple proportion, then, was sufficient to ascertain the total weight of the extract which the whole of the tincture would have produced.

15 grammes of cinnamon, for instance, were macerated with 5 parts, or 75 grammes of alcohol, at 80°; the weight of the tincture that passed through the filter was 27 gr. ·08; that of the extract obtained from this quantity of tincture, and completely dried, was 0gr. ·94. Deducting 0·94 from 27·08, we obtained 26·14 for the weight of the alcohol con-

tained in the evaporated tincture: then, the following proportion 26·14: 0·94 : : 75 = x gives the total weight of the matters the whole of the alcohol has dissolved: x = 2gr. ·69 of extract.

All these experiments were made with the same care. I always employed the same substance for each series of experiments, and for that purpose I prepared powders of each in sufficient quantity for all the operations. The maceration lasted fifteen days in each case, and to avoid any loss of alcohol during the filtration, the receiving vessel was covered with a sheet of paper fixed to its edge, having in its centre a hole just large enough to allow the tube of the funnel to pass through; the latter was also covered with a sheet of paper kept in its place by a plate of glass.

As to the means of determining the proper strength of the alcohol, it was thought proper to vary it according to the nature of the substances to be experimented on.

When the active principles contained in those substances were clearly defined and characterised, I ascertained their quanities; this I was able to do in the case of barks, nux vomica and jalap.

These quantities were ascertained in the following manner: for bark and nux vomica the tincture was evaporated in a sand-bath, and the extract obtained was treated with acidulated water, the filtered liquor was precipitated by means of subacetate of lead, to remove feverish matters from the alkaloïd, and then the excess of lead having been separated by sulphuretted hydrogen, the alkaloïds were precipitated by means of a solution of pure tannin; it was therefore while in the state of tannates that the quantities of the alkaloïds were ascertained.

For jalap, I extracted the resin of a given quantity of the tincture.

But if, in the case of these substances, the management was easy, it is not the same for the greater number, in which the active principles are ill defined, and possess no characteristic chemical properties. How, for example, in

the case of hemlock, rhubarb, gentian, &c., can we discover whether the tincture prepared by means of alcohol at 80°, contains a greater proportion of the active principles than that prepared with alchol at 56 ?

Among these substances there are some whose properties are contained in a bitter principle, as in the case of rhubarb, gentian, and wormwood. For these substances I took two determinate quantities, prepared with alcohol of different degrees of strength, diluting them with water to discover that which required the greatest quantity of this liquid to remove the bitterness. Unfortunately there are too many substances for which this mode of investigation cannot be employed, and this was a difficulty I was unable to overcome; it was only by calculation based on the chemical analysis of these substances, that I selected alcohol of a fitting strength. The only method, in my opinion, of attaining the desired object in these cases would be to employ medically, tinctures prepared with these matters, and alcohol of different degrees of strength.

The strength of the alcohols I employed were to the number of five, namely, alcohol at 90, 80, 70, 56, 45 per cent.

To make the facts I relate intelligible, I will, in the first instance, lay down the following principles, to which I was guided by nearly 300 experiments made in this manner.

1. The different strength of the alcohols recommended by the "codex" are not always those which are the best to dissolve the active principles contained in the substance employed.

2. The proportion of four parts of alcohol for one of the substance, adopted by the codex, is scarcely in any case sufficient to dissolve, entirely, the soluble matters of those substances.

3. The proportion of alcohol necessary completely to exhaust these substances, is five parts of alcohol to one of the substance employed. In two or three cases, however, four parts of alcohol are sufficient, but it is useful, I think,

considering the small number of the exceptions, in general, to adopt five parts of the solvent.

4. The proportion of alcohol is always sufficient when it well covers the matters submitted to its action, when these matters are herbaceous, as leaves; but in other cases it is not enough.

I must observe, that whenever the difference between the quantity of the matter dissolved by the alcohol of the strength of prescribed by the "codex," and that I have employed, has been so trifling as to be insignificant, I thought it right to adhere to the strength recommended in that formulary, to avoid almost useless changes.

EXPERIMENTS.—I. YELLOW BARK.

								grs.
1 pt. or 15 grs.	by	60 gr.	or	4 pts.	alcohol at	80°	total, ext. of tinct.	1·63
" "		75 "		5 pts. "		80 id.	"	1·55
" "		id. "		id. "		id.	"	1·59
" "		90 "		6 pts. "		id.	"	1·47
" "		75 "		5 " "		70°	"	1·42
" "		60 "		4 " "		56°	"	1·43
" "		75 "		5 " "		id.	"	1·74
" "		90 "		6 " "		id.	"	1·68
" "		75 "		4 " "		45°	"	1·50
" "		90 "		6 " "		id.	"	1·78

The quantity of the akaloïds was ascertained in the manner I have already described.

150 grammes of the tincture, with 1 part of bark to 5 parts alcohol at 80° weight of precipitate, . . . 2·451

150 grains of tinct. with 1 pt. bark and 5 pts. alcohol, at 56°, ... 0·696

The first calculation made under different circumstances, gave for alcohol at 80°, ... 1·797

And for alcohol at 56°, ... 2·641

We see, by these results, that alcohol at 80°, although it does not contain the largest quantity of extract, removes, however, a much larger amount of the active principle than weaker alcohol.

The preference ought, therefore, to be given to that degree of strength; besides, five parts of the solvent being the proportion that gives the most extract, that proportion ought to be adopted.

II. RED BARK.

								grs.
1 pt. or 15 gr.	by	60 gr.	or	4 pts.	alco. at	80°	total ext. of tinc.	1·97
" "		75 "		5 "	"	id.	"	2·42
" "		90 "		6 "	"	id.	"	2·37
" "		75 "		5 "	"	75°	"	2·05
" "		60 "		4 "	"	56°	"	1·98
" "		75 "		5 "	"	id.	"	2·31
" "		90 "		6 "	"	id.	"	2·26
" "		75 "		5 "	"	45°	"	1·99

QUANTITY OF THE ALKALOID.

150 grs. of tinct. made with 1 pt. bark and 5 pts. alco. at	80°	precip.		1:346
150 "	"	"	56°	" 1:394

We perceive that, in contradiction to what took place in the case of yellow bark, alcohol at 56° dissolves more of the active principle than alcohol at 80. I therefore, prefer alcohol at 56°: and as five parts give a larger quantity of extract than four, I adopt the proportion of five parts of that solvent.

III. GRAY BARK.

								grs.
1 pt. 15 gr.	by	60 gr.	or	4 pts.	alco. at	80°	total ext. of tinct.	2.69
" "		75 "		5 "	"	id.	"	2·89
" "		60 "		4 "	"	56°	"	3·21
" "		75 "		5 "	"	id.	"	3·15
" "		90 "		6 "	"	id.	"	3·07
" "		75 "		5 "	"	45°	"	2.87

QUANTITY OF ALKALOID.

150 gr. of tinct. made with 1 pt. bark and 5 pts. alco. at	80°	precip.		1·102
150 gr. "	"	"	56°	" 1·795

These results are again the reverse of those obtained with yellow bark; here once more it is alcohol at 56° that dissolves most of the active principle. This experiment agrees with the result of M. Guibourt obtained in 1818, when the Codex of that year was edited, by ascertaining the action of alcohol at different degrees of strength on gray bark; he found, in

fact, that the residue of the gray bark treated by alcohol at 80° still remained bitter, while that which had been treated by alcohol at 56° was insipid.

I should, therefore, give the preference to alcohol at 56°, as the Codex does, and although four parts of this solvent are, as we see by the table, sufficient to dissolve all the soluble matters, I should adopt the proportion of five parts to get rid, as I said above, of these few objections.

We are struck in the very onset with the difference of the results obtained with yellow bark and the two other varieties used; we may ask ourselves the explanation of this anomaly. The most plausible explanation appears to me to be the following: yellow bark, as we see by the last experiments made with it, is that which yields the smallest quantity of extract to alcohol of various degrees of strength—containing consequently fewer extractive or other matters, enveloping the active principle; this last is found in immediate contact with the concentrated alcohol, which is its best solvent; while in the case of the two other varieties of bark, these extractive matters, which are found in greater quantity, are coagulated by the concentrated alcohol, and thus shield the active principle from the action of the solvent. We see, in fact, that in the case of the red bark, which furnishes a smaller amount of extract than the gray bark, the difference between the quantity of the alkaloïd dissolved by strong and weak alcohol is small, while it is considerable in the case of gray bark, which furnishes the greatest quantity of extract.

May we not, also, admit the existence of certain principles at present unknown or badly defined, more or less soluble according to the species of bark to which they belong, principles that will either hinder or assist the solution of the active principle? Notwithstanding the progress of organic chemistry, this science is not at present sufficiently advanced to enable us to understand the composition of organic bodies, and consequently prevent our laying down this hypothesis.

(To be continued.)

ART. V.—AN ESSAY ON LACTUCARIUM.

By Emile Mouchon.

Since we have been indebted to M. Aubergier for the cultivation of the lettuce, for the purpose of extracting the lactucarium, on a sufficiently large scale to satisfy the wants of the moment, the medical use of this valuable agent surely ought to become general in France.

The thridace (expressed juice of the lettuce) of our pharmacopolists, which we must, nevertheless, be cautious not to consider entirely without virtue, when it has been prepared by a skilful hand, will, for the future, be destined to play a very secondary part, but without being completely neglected, if the honorable pharmacopolist of Clermont, Ferrand, who has made so many and such noble efforts to attain his end, should find sufficient imitators, to meet the constantly increasing consumption of lactucarium. The success of our brother laborer has been so great, also, that we may be well permitted to hope so good an example will not be lost upon us, however great may be the obstacles to be surmounted to realize similar results.

In his last work on lactucarium, M. Aubergier, enters into very interesting details, which induce us to believe that this direct product may be utilized under the form of a syrup, in preference to every other mode of employing it. The author considering also that alcohol at 21° must be the fittest menstruum to dissolve the active principle, proposes to add to simple syrup, the alcoholic extract of lactucarium.

A proposition of this nature deserves consideration when it comes from so skilful and estimable a fellow-laborer, as M. Aubergier. In the meantime, as it bears upon an important subject, it appears to me to be proper enough to examine how far he is right, whatever confidence observations based on his experience may inspire. On this account

I propose, in my turn, freely to examine the question, not, most certainly, presuming to resolve it completely, but, at least, with the intention of facilitating the solution.

And in the first place I must call attention to the fact that nothing proves that the lactucarium taken in a natural state, in pills for instance, according to the express recommendation of Doctor Francois, is not more active than its alcoholic extract, and other preparations of which it may be the base. Lactucarium is a complex body, it is true, but is it not to be feared that in separating its principles we may weaken its properties? If it were possible for us to procure opium in tears (the gobaar of the Persians,) a product which in certain points of view cannot be compared to anything so well as lactucarium, should we be disposed to alter its nature with the intention of rendering it more efficacious? I think not; for although this also is a complex body, it is not the less the result of a simple exudation, a milky juice, thickened on the plant itself. If the opium of commerce could, in this respect, be compared to it, none of us, perhaps, would ever have conceived the idea of subjecting it to the various transformations it undergoes in our laboratories, leaving out of the question, however, the learned chemical investigations to which we are indebted for the happy possession of the salts of morphine.

Besides, less exclusive than M. Francois, I am far from thinking that certain preparations of lactucarium are without efficacy; I believe them, on the contrary, to be extremely active; still I prefer the lactucarium in substance, or associated with other agents that cannot in any manner act on its principles. In my opinion it is a substance which ought, as much as possible, to be kept out of the reach of the action of heat, and be maintained in its integrity; for I am disposed to think it is easily changed by certain influences, without, however, having anything very positive to produce in support of this opinion; it is a presumption, nothing more. I press this point no further, because I do

not attach to it more importance than its object deserves. Another case ought to occupy me more seriously—it is that which is attached to the question of ascertaining what menstruum is best for the treatment of lactucarium. Ought we, in fact, to employ weak to concentrated alcohol, sulphuric ether to distilled water, as M. Aubergier thinks? Such is the question I propose to examine in this paper. It is the more delicate on my part, because it may place me in opposition to a skilful brother, for whom I profess the most profound esteem. Still, as we both of us are guided by the ame wish, I have every reason to believe that he will be glad I have inquired into the same subject, even if I run counter to his opinion, so long as I succeed in deducing useful conclusions.

Treatment of Lactucarium with Ether.

Two grammes of M. Aubergier's lactucarium yielded to this menstruum 65 centigrammes of a dry substance, white, light, friable, extremely bitter, &c. Two doses of the ether are sufficient, a third is almost superfluous, for it has scarcely any effect on the residue. We may indeed, strictly confine ourselves to one, for with 16 parts of sulphuric ether, the second dose only furnished 4 or 5 centigrammes of the product.

It is evident this ethereal extract cannot be an agent fitted to replace the lactucarium; for the active matter, extracted on account of its soluble properties, appears in a very small quantity. Still, however, it must not be considered entirely inert; its decided and characteristic bitterness will not allow us to imagine this. It only satisfies us that the sulphuric ether ought to be rejected, when we wish to extract the whole of the active matter of the lactucarium, and while we attribute to it an action upon the same body, although it may be feeble; this will allow us to believe that a certain degree of virtue exists in the etherolate of lactucarium; that may, perhaps, be employed efficaciously in certain cases,

where the combined use of the two agents seems to be indicated. The instantaneous action of the dissolvent would enable us, in a case of necessity, to prepare this ethereal tincture extempore.

Treatment with Alcohol.

The dissolvent power of alcohol on lactucarium resembles that of ether in a greater degree in proportion to the greater concentration of the former. The result of this incontestible truth is that we are obliged to have recourse to alcohol at 21°, as the pharmacopolist of Clermont proposes, when we wish to act upon this body by means of alcohol.

These treatments with alcohol need not be several times repeated; the first treatment carries off almost the whole of the principles that can be combined with weak alcohol. Thus, after twenty-four hours maceration, 8 grammes of lactucarium yielded to 60 of hydro-alcohol at 21°, 3 grammes of a dry extract, of a clear brown color, while a second dose produced only 50 centigrammes; and this was almost all that alcohol at that degree of concentration could extract from the lactucarium. We must add to this observation that the second product bore scarcely any resemblance to the first, although the bitterness was very decided. The alcohol of this second operation, also, had no resemblance to that of the first; it was milky white; that of the first was deeply colored, and rather clouded. A third addition of alcohol left all the matter upon which it could act upon the filter, so that the alcohol was quite milky before the filtration, and perfectly colorless afterwards. That which was left in the capsule was almost insignificant, its weight being not more than 5 centigrammes.

As to the residue, it was no longer bitter, it was insipid. But, if it be acted on by 8 grammes of ether, it makes it bitter and tenacious, and gives up so much of its substance, that 75 centigrammes of dry and almost inert matter remains on the filter. The dissolved matter that remains in

the evaporating vessel, is white, friable, easily reduced to powder and sensibly bitter. Exposed to the action of 125 grammes of boiling distilled water, it makes the liquid decidedly bitter, without sensibly clouding it. The treatment causes it to lose a fifth part of its weight. A strong heat makes it swell, then liquifies it, and causes it to burn with a flame, without leaving the least residue. Thus liquified it is extremely adhesive, and very elastic; ether alone can remove it from the substance to which it adheres; properly speaking it is caoutchouc, for it has all the properties of that body, and all its physical characteristics.

It is worthy of remark, that after having been subjected to the successive action of alcohol and sulphuric ether, this substance still gives up a fifth part of its weight to distilled water, and that it imparts a characteristic bitterness to this last solvent, without, however, causing it to lose its transparency. I draw attention to this observation, because it will assist me in my judgment when I shall have to give my opinion on the nature of the menstruum that should be employed to remove the whole of the active matter from the lactucarium.

Treatment with cold distilled Water.

The nature of lactucarium scarcely allows us to consider cold water as a proper solvent of this concrete juice. Still the result of several trials made with the greatest care, is that it can give up one quarter of its weight of one soluble substance or another, if we have recourse to one or several macerations of from twelve to twenty-four hours duration, with 32 parts or more of distilled water.

The liquid is in that case extremely bitter, and rather milky. Its slow evaporation, in a glass capsule, furnishes an extract, which does not appear to differ from the alcoholic extract.

Treatment with boiling distilled Water.

Of all the solvents employed in my different essays this is,

evidently, the one I ought to prefer. In fact it is only necessary to place the lactucarium over the fire, until 32 parts of distilled water have boiled, to extract 60 per cent. of its weight, by squeezing the residue in a fine cloth.

The liquid thus collected is extremely bitter, slightly cloudy, and tolerably colored. The substance it leaves in the capsule has all the characters of the preceding. It has a reddish color, semitransparent when in thin flakes, and is insupportably bitter. Boiling distilled water, in sufficient quantity, dissolves the greatest portion instantaneously, and keeps the remainder suspended. The liquid, as it becomes cold, becomes a little clouded, but deposits scarcely anything. This desposit is slightly colored; but it is of little consequence, its quantity being so extremely small.

If we treat the insoluble residue with a fresh quantity of boiling distilled water, we find the same weight after it is perfectly dry. It is the same when this body is macerated in alcohol; let the density of the liquid be either weak or strong, 21 or 36 degrees, the residue remains untouched. Sulphuric ether, alone, has an action, and a powerful action, on this residue. It carries off more than four fifths of its weight of the white substance already noticed, but to produce this effect maceration of 12 hours duration, at least, are necessary; a third has scarcely any result. The ethereal liquids, the first particularly, is of a strongly marked bitter taste, which gives us reason to suspect the presence of a small quantity of the active matter. Still we must only to a certain extent take this bitterness into account, for we ought not conceal from ourselves that ether itself is sensibly bitter.

In addition to this, we may remark, that all these extracts, the aqueous extract in particular, on which heat has had most influence, possess in a very slight degree only the poisonous smell that so well distinguishes lactucarium. This appears to me to prove clearly enough, that the poisonous principle, on the importance of which we must

not deceive ourselves, is partly volatilized during the operation, although the greatest precautions have been taken to preserve it in the product.

This remark is not applicable to the aqueous solution resulting from the instantaneous action of boiling distilled water on native lactucarium. It possesses in a high degree that poisonous smell, and the bitterness, that are such essential characteristics of this vegetable production.

According to all these facts, it appears to me to be most advisable to reject the alcoholic extract proposed by M. Aubergier, and to confine ourselves to the direct treatment of lactucarium with boiling distilled water.

This menstruum removes exactly 50 per cent. of the lactucarium; it would also be advisable to employ two grammes of this base, with 500 of syrup, for the purpose of agreeing as nearly as possible with the operations of our fellow-labourer. Nevertheless, I should consider it still more rational to let the lactucarium enter into the composition at a multiple, that should come as near as possible to the same proportions, as it does in the following formula:—

Syrup of Lactucarium.

Lactucarium in coarse powder,	1 gramme 70.
Distilled water	30 grammes.
Simple syrup	500 "

Place the lactucarium over the fire, along with 15 grammes of water, until the liquid boils; pour it out and press out the liquor, complete the extraction of the matter with an equal quantity of boiling water, pour out this second solution, add the two products to the boiling syrup, and reduce the whole to 500 grammes.

By this process, as simple as it is easy, you realize in an instant, a product whose characters leave no doubt as to the excellence of the medicament. The bitter taste is more decided than in that of M. Aubergier, and the poisonous smell of lactucarium is recognised in all its force.

Thirty grammes of this syrup are equal to 10 centigrammes of the base, and 5 of the extract. This is a reasonable

proportion in more than one respect; the medical action of the remedy being sufficiently powerful to enable you to confine the dose to that of 15 grammes, at most, during 24 hours, and the proportional quantity of the medicine cannot be forgotten.

In addition to this, we must not forget that the stomach, according to Dr. Francois, soon accustoms itself to the action of lactucarium, and it is impossible to produce any sensible effect for many successive days, without rapidly increasing the doses of the medicine; being able to return to the first dose after an interruption of a couple of days. By neglecting this principle, the foundation for which rests on numerous observations, we frequently expose ourselves to miscalculations, which cannot fail to raise a prejudice against lactucarium.

The conclusion to be drawn from the preceding observations appears to me to be very easy. It is evident, in fact, that there is no advantage in treating the lactucarium with alcohol, either weak or strong. Neither does the preparation of an alcoholic extract offer any thing advantageous in practice, while everything is to be gained by the employment of boiling water to extract the active matter; whether we operate for the purpose of introducing it into the syrup, or into any other officinal preparation, without having recourse to any previous concentration.

These conclusions appear to me to be the necessary corollary to the facts I have submitted to the consideration of practical men. In addition to this they seem to answer the end proposed in a most satisfactory manner. Nevertheless, it shall not be my last observation. The confidence with which lactucarium inspires me, imposes upon me, in my turn, the obligation of pointing it out as an agent of the first class, which cannot receive too much attention, in regard to the numerous counter-indications opium exhibits, for which it may fairly be considered as the best succedaneum. Febrile affections are those only that have been mentioned,

as contrary to the exhibition of this remedy, which must also never be administered while the work of digestion is going forward. Its sedative effects on the nervous and vascular system enables it to relieve pain by producing sleep, without any appearance of narcotic effects; it has also been remarked that it usually succeeds in cases where opium has completely failed. It is from these truths that have become trite, but which, nevertheless, cannot be too often repeated, after the miscalculations the thridace of our pharmacopolists have enabled us to place on our annals, as much perhaps from the insufficiency of the doses, as from other causes, which I must pass over in silence.

If the most celebrated physicians of antiquity, with Hippocrates at their head, never feared to place their confidence in lettuce, why should we refuse ours to lactucarium, or to thridace, now the labours of our contemporaries have placed their efficacy beyond doubt? The "plant of the Eunuchs," as the Pythagorians called it, with some reason —that which made Musa, the physician to the Emperor Augustus, worthy of a statue—has not been able to fall in the estimation of mankind; and if, in our days, there are practitioners who despise its sedative powers, it is because, in these times, medical scepticism, become systematic and too exclusive in certain minds, possesses a most mischievous influence even on the most valued agents. Extremes in all things, particularly in medicine, are extremely deplorable; but the time has not yet arrived when what is reasonable shall be right. In the meantime, if it be true, as the immortal Bacon says, "that we rise from facts to axioms," and that afterwards we redescend from axioms to practice, we must necessarily acknowledge that no agent deserves better than lactucarium the various appliances to which it has been subjected, and believe that the opinion of men of science, without any exception, will be completely in its favour.—*Ibid. from Jour. de Chim.*

ART. VI.—ON THE MORINGA PTERYGOSPERMA, OR OIL OF BEN TREE, AND ITS USES ECONOMICAL AND OFFICINAL.

By William Hamilton, M. B.

The Moringa pterygosperma, or horseradish tree, although not a native of the West Indies, is now perfectly naturalized there, and merits attention both for its economical and pharmaceutical properties.

It is a small tree, of about twenty feet in height, but of most rapid growth, coming into flower within a few months after the seed has been sown, and continuing to produce seeds and blossoms afterwards throughout the year. Its roots have all the flavour and properties of the horseradish, for which it is often substituted at the tables of the planters. The timber is said to dye a fine blue; and the gum which exudes from wounds in the bark bears a strong resemblance to that obtained from the Astragalus tragacantha, for which it might, no doubt, be substituted. The timber was formerly held in estimation for medicinal properties, which it was reputed to possess, and may be found spoken of in some of the older medical writers under the name of *Lignum nephriticum*, from its supposed efficacy in complaints of the kidneys and urinary organs. It gives out a blue colour to spirit or water, which by transmitted light appears of a golden yellow; the blue is destroyed by acids, which leave the tincture or decoction of a bright yellow, but is restored by the addition of an alkali.

The numerous racemes of white blossoms with which the moringa or horseradish tree is constantly loaded, are succeeded by long triangular pods, somewhat torulose at the seeds, and about two feet in length, when arrived at their full growth. These pods, while yet young and tender, are not unfrequently cooked and served up to the planters' tables like asparagus, for which they are no bad substitute.

Each pod, when full grown, contains about fifteen seeds: each considerably larger than a pea, with a membranous covering expanding into three wings, whence the specific name of pterygosperma: a kind of isthmus is interposed between each of these seeds, forming the pod into as many cells as it contains seeds.

On removing the winged envelope, the seeds appear somewhat like pith-balls; but, upon dividing them with the nail, they are found to abound in a clear, colourless, tasteless, scentless oil, of which the proportion is so large that it may be expressed from good fresh seeds by the simple pressure of the nail. Geoffry informs us, that he obtained 30½ ounces of oil from 8 pounds of the decorticated seeds, being at the rate of very nearly 24lbs. of oil from 100 lbs. of seeds. The oil thus obtained is the celebrated oil of Ben or Behen, which, at one period, constituted a valuable branch of commerce with the east, until excessive imposts and extensive adulteration brought it into unmerited disrepute.

The moringa tree, as we learn from Dr. Broughton's Catalogue of East's Garden, inserted in the third volume of *Edward's History of the West Indies*, was introduced into Jamaica from the East Indies in the year 1784, and most probably found its way into the other islands about the same time. Yet though thus established for the best part of three-quarters of a century among our planters, notwithstanding the great value of its oil, and the facility with which it can be obtained, the moringa tree has been hitherto valued merely as an ornamental shrub, and cultivated for the sake of its young pods, or the horseradish of its roots, as luxuries for the table.

The oil which is so profusely obtained from the seeds is peculiarly valuable for the formation of ointments, from its capability of being kept for almost any length of time without entering into combination with oxygen.

This property, together with the total absence of colour,

smell and taste, peculiarly adapts it to the purposes of the perfumer, who is able to make it the medium for arresting the flight of those highly volatile particles of essential oil, which constitute the aroma of many of the most odoriferous flowers, and cannot be obtained, by any other means, in a concentrated and permanent form. To effect this, the petals of the flowers, whose odour it is desired to obtain, are thinly spread over flakes of cotton wool saturated with this oil, and the whole enclosed in air-tight tin cases, where they are suffered to remain till they begin to wither, when they are replaced by fresh ones, and the process thus continued, till the oil has absorbed as much as was desired of the aroma; it is then separated from the wool by pressure, and preserved, under the name of *essence*, in well-stopped bottles. By digesting the oil thus impregnated in alcohol, which does not take up the fixed oil, a solution of the aroma is effected in the spirit, and many odoriferous tinctures or waters, as they are somewhat inaccurately termed, prepared which could not otherwise be obtained. By this process most delicious perfumes might be obtained from the flowers of the Acacia tortuosa, Pancratium carribeum, Plumeria alba, Plumeria rubra, and innumerable other flowers of the most exquisite fragrance, which abound within the tropics, blooming unregarded, and wasting their odours on the barren air. *Pharm. Journ.*

ART. VII.—ON THE GUM OF THE RHUS METOPIUM, AND ON THE ARISTOLOCHIA ODORATISSIMA, TRILOBATA, AND ANGUICIDA.

By William Hamilton, M. B.

The Rhus metopium is a small tree of some twenty-five feet in height, not unfrequent in the West Indies, and especially in the forests of Jamaica, where the gum which exudes from its bark has been long known for its medicinal properties, although little employed by the regular practitioners. It is commonly known by the names of hog gum and hog-doctor tree, from an opinion which is generally entertained, and rests no doubt on observation, that the wild hogs, which abound in many parts of the island, cure themselves of any wounds which they may chance to have received, by rubbing themselves against the trees from which this gum exudes,* and thus smearing the excoriated part over with a coating of it. This circumstance, first observed no doubt by the negroes, naturally directed attention to its vulnerary qualities, and led to its trial as a salve for healing sores. For this purpose it is boiled with the oil of the Ricinus communis, to which is occasionally added the expressed juice of some of the species of dolichos, known by the name of cat's claws (as the Dolichos filiformis,) when the object is to check the discharge from a running ulcer.

The hog-gum first exudes from the wounded bark in the form of a pellucid juice of a yellowish-white colour, which becomes darker by exposure to the air, and gradually

*For this purpose, taught by what in our ignorance we designate by the unmeaning appellation of instinct, the boars when they do not chance to meet with a tree already wounded and pouring forth its balsamic juice, rip up the bark with their tusks to obtain it. Is not this something closely bordering on reason?

acquires a black colour, and a hard brittle resinous consistence.

In its recent state, this juice, taken to the extent of one or two table-spoonfuls diluted with an equal quantity of water, and sweetened with a sufficiency of sugar, is said by Dr. Barham to afford relief in cases of colic, and to act at the end of four or five hours as a mild aperient. It is also employed for the same purpose in the shape of an enema.

By age it acquires a harder consistence, and becomes astringent in its properties. In this state it is reputed to act as a diuretic upon the urinary organs, and is given in pills for the cure of gonorrhœa, resembling in its effects the more costly balsam of copaiva, for which it might not improbably be substituted with advantage in our shops.

Applied in the form of a plaster to the inflamed part, this gum is said to afford relief in gout and rheumatic affections; acting in these cases not improbably as a substimulant, and exciting the action of the absorbents.

As a topical application to recent wounds and excoriations, both Barham and Browne speak in the highest terms of its vulnerary effects; and the former recommends a cerate, prepared according to the following form, as an excellent remedy for recent wounds:—

℞ Gummi rhus metopii,
Adipis præparati, aa ℥iv.
Ceræ albæ,
Pulveris aristolochiæ odoratissimæ, aa ℥ij.
Resinæ flavæ, ℥j.

M. s. a. ut fiat ceratum.

The aristolochia, which enters into the composition of the above preparation, is a climbing plant frequent in the woods of Jamaica, where it is in considerable estimation among the the local practitioners under the names of *birthwort* and *contrayerva*. Its roots and seeds are bitter and aromatic, and are reputed to be powerful antidotes to the poison of serpents and other venomous reptiles. The roots in decoction are an

excellent tonic and stomachic, but as their active principle is more completely soluble in spirit than in water, the tincture is a still better preparation, and combined with iron very effectual in restoring the menstrual discharge when it has been suppressed or interrupted.

This plant is so abundant in Jamaica, that, were a market found for it in England, a supply to almost an unlimited extent might be obtained; entitling it to the attention of the medical practitioners as a cheap and valuable substitute for some of the more costly articles of the Materia Medica of our shops.

There are many other species of aristolochia common within the tropics, and equally entitled to attention for their medicinal properties: of which the Aristolochia trilobata is to be met with on the south side of Jamaica as abundantly as the A. odoratissima is on the north, and the infusion of its roots is a favorite stomachic with the negroes, who are in the constant habit of employing it, under the name of bastard contrayerva.

In the woods which clothe the hills adjoining the town of Carthagena, the capital of the province of that name in South America, is found another species, the Aristolochia anguicida, known to the inhabitants by the name of snake poison, or contra capitan, the external and internal use of which, if employed in sufficient time, is said to counteract the bite of the most deadly serpents. The Indian jugglers mix the juice of its roots by mastication with the saliva, of which they introduce a few drops into the mouths of the snakes which they exhibit, in order to stupify and enable them to handle them with impunity.

Facts such as these are well worth medical investigation.

Ibid.

ART. VIII.—ON COCHINEAL.

By August Faber, Esq.*

On board the "Tay" West India steamer, in which I came out, there was also as passenger, Mr. Innis, merchant, going out to Vera Cruz. His residence is in the city of Oaxaha (pronounced Oa*h*aka) in the province of that name, where chiefly cochineal is grown. The following information, which I obtained from him, is in several respects very interesting:—

1. "Silver cochineal is the impregnated female just before laying eggs; black cochineal is the *female after laying and hatching the eggs.*

2. "The female, just before laying the eggs, spreads out a large quantity of white powder immediately around her, and to a great distance, in a circle; and the Mexican growers are in the habit of blowing this white powder off the plant as much as possible, saying the young do better without it."

Now we begin to know something of the origin of the difference of colour and shape and *quantities*, in this way: the black, if good, is always *shelly*, the real silver is *never* shelly; and of black cochineal, there is never more than one bag in twenty, or in thirty, or fifty imported, being in fact only what had been kept for seed.

The last quotation given above would suggest to me one more possible fact.

Why, I would ask, is the Honduras cochineal (which, in fact, grows in Guatimala) *invariably brilliant* in colour (silver,) while the Mexican is *invariably* dull, the latter fetching 3*d.* and 4d. per lb. less than the former? I consider it very probable, that the habit of blowing off what is given by nature, namely, the white powder deposited by the females, may be

*Extracted from a letter dated "Madeira, October 18, 1845," addressed to Dr. Pereira, and read before the Pharmaceutical Society.

the reason not only of the dulness of the colour, but also of the generally smaller grain.

3. Mr. Innis told me further, that the more extensive cultivators never kill the insect by immersion, but only by the basket being placed in heated rooms or stoves. The smaller and poorer cultivators use hot water, "by which the insect is mostly burst open, and the 'foxy' colour produced."

"Foxy" is the technical London name for silver cochineal, rather reddish, and very different from the fine transparent red, which forms the finest black.

As I am upon this article, I beg to add a few remarks, more strictly commercial:—

1. The serons in Guatimala are made up to 150 lbs., a mule *there* not being able to carry more than 300 lbs. over the mountains. In Vera Cruz, the distance from shore is 300 miles, but not being so mountainous, the mules carry 400 lbs., the serons being made one-third larger than at Guatimala.

2. In London, every seron of cochineal, on its arrival, is turned out and sifted by the dock companies, filled into English bags, on which the tare to the ounce is marked, the dust of a whole parcel (of 100 to 500 bags) being put together and sold separately from the grain. The invariable custom of sifting exists in no other port than in London.

3. There still exists as an article of commerce, but only just still exists, the sort called "English-dyed black cochineal."

When, in 1826, I established myself in London, this article was extensively shipped to India, Russia and Austria, and for a number of years my Price Current had the quotation of "English black cochineal;" and, in fact, being cheaper in many places, they would not have the genuine black. It was Mexican silver grain *dyed*, and prices were about the following:—Genuine black, 6*s*. 6*d*.; English dyed, 5*s*. 6*d*.; Honduras silver, 5*s*. 6*d*.; Mexican silver, 5*s*.

Note added by Mr. Wood, Mr. Faber's Clerk.

Granilla is imported from the same places as the cochineal, namely, Honduras and Mexico, and consists of the very small immature insects. Its value is from 2*s*. to 4*s*. per lb. according to quality.

Garblings consist of the broken pieces of the insects, mixed with the dust and extraneous substances that must of course be gathered with the insects in taking them from the plants. As garblings contain generally a good proportion of the broken particles of matured insects, they are frequently preferred to granilla, unless the latter be of unusually good quality. The value of garblings is 2*s*. to 2*s*. 6*d*. per lb. Each bag of cochineal is sifted here on importation, and it is in this manner that the garblings are obtained, as they are seldom imported so.

The following is a table of the quantities of cochineal exported from and consumed in England in the last twelve years:—

	lbs.		lbs,
1833	309,125	1839	1,010,193
1834	405,350	1840	1,330,295
1835	516,132	1841	1,439,742
1836	604,425	1842	1,207,920
1837	517,882	1843	1,457,456
1838	536,044	1844	1,569,120

Chem. Gaz. from Pharm. Journ.

ART. IX.—NOTE ON IRIDESCENT SILVER.

By Prof. John Brockelsby.

It is well known to those who are conversant with optical phenomena, that the brilliant play of prismatic colours exhibited by mother of pearl is due to the structure of the surface; provided the shell is cut and polished in a particular manner. This interesting fact was announced to the scientific world in 1829 by the discoverer, Dr. Brewster, who successfully transferred by pressure the splendid tints of the pearl to black wax, fusible metal, balsam of tolu, lead, tin, and various other substances. The colors displayed by fusible metal possess at first extraordinary beauty, which in a short time is partially lost, owing to a change that occurs upon the surface of the metal.

A few months ago, while engaged upon some experiments in electrotyping, I was led to think that by this process the hues of the pearl might be readily transferred to those metals, which from their hardness are incapable of receiving impressions in mass, but yet, on account of their freedom from oxidation, retain for a long time a surface comparatively pure. I therefore took a Smee's battery, which I had just constructed, and after several experiments succeeded in obtaining small sheets of silver, radiant with the hues of the shell. When seen by a single light, as that of a lamp, the play of colours is surpassingly beautiful, scarcely inferior to that of the pearl; and where equal care was employed, the plate of silver, which was formed eight months ago, rivals in brilliancy that which came fresh from the battery a few hours since.

The process by which this result is obtained is as follows. The first thing required is to prepare the shell. This is effected by grinding, and polishing it upon the back, in such a manner as to cut through the numerous concentric strata that compose its substance. When this is done, by the aid of a

microscope the surface will be seen covered with delicate grooves, some thousands in an inch, formed by the sections of the concentric laminæ, and this configuration gives rise to the glowing tints of the shell. The next step is to obtain an exact impression of this surface upon some good conductor of electricity. This we are enabled to do by means of fusible metal, if proper precautions are employed in taking the impression. I pursue exactly the same method as in taking the copy of a medal. After fusing the metal, I pour it upon oiled paper, and when the air bubbles cease to rise through the metal the oxide is skimmed from its surface with a card, and as soon as it presents the appearance of a perfect mirror the shell is forced down upon it by a sudden pressure. When the metal has cooled I remove it from the shell, and having ascertained the accuracy of the impression, immediately plunge it, before any change of the surface can occur, into the silver solution, thereby completing the circuit between the poles of the battery. In a few moments the surface of the metal is frosted with silver, and the configuration of the shell exactly copied. A sheet of silver, of sufficient thickness to be easily removed with a pen-knife, will be deposited in the course of five or six hours under favourable circumstances. The battery I have employed consists of two plates of amalgamated zinc and one of platinized silver, six inches by eight. The working mixture is sulphuric acid and water, the strength varying with the temperature, and the amount of work to be performed. I have found a wine-glass of acid to three quarts of well-water, at the temperature acquired by standing a few hours in a room at 70° Fah., to answer very well, when the surface to be plated did not exceed 1½ square inches. The silver solution is made by dissolving cyanide of potassium in water, and adding thereto the oxide of silver. The ratio of the ingredients I am unable to state, as I have not hitherto directed my attention to this point, but have prepared the solution by trial until I obtained the desired result.

By the process above described, we can at pleasure transfer

the tints of the pearl to those pure metals, which will best preserve their brilliancy, and while the knowledge of this fact is interesting as a matter of science, it may perhaps be well for the artist to consider if it cannot be applied to some ornamental purpose, and the beauty of the precious metals enhanced, by teaching them to glow with the richest hues of light.—*Silliman's Journal.*

ART. X.—ON PALM SUGAR FROM INDIA.

By Mr. James Stevens.

Palm sugar is manufactured principally at Cuddalore on the Coromandel coast, by some French merchants of Pondicherry, by which means it comes into the English market as colonial sugar, whereas, if made at Pondicherry, it would bear the heavy duty of foreign produce.

It is mostly got by refining the *jaggary* or crude sugar used by the poorer classes in India. *Jaggary* is darker coloured than the coarsest Muscovado sugar. It is granular or moist; comes in a mat or bag made of palm leaves; is chiefly brought from the island of Ceylon by native vessels (donies) and is made by inspissating the juice of various kinds of palm, principally the *Palmyra* or brah palm, also the cocoa palm, and the *lesser fan palm*, and to the northward, the wild date palm. The juice is collected during the night, by making incisions in the upper part of the stems of the trees, and afterwards boiling it down before fermentation takes place; chunam (lime from sea shells) being added to retard the same. The thick syrup thus obtained is mixed with sand and stones to the amount of ten or fifteen

per cent. to make it more solid, portable, and heavier (of course this is done by the natives, the most abominable set of rascals under the sun.) The same juices, before they ferment, form a cool and pleasant drink, toddy; but if allowed to go on to vinous fermentation, become arrack, which is distilled. In India, all the palm plantations (toddy topes) used for the last two purposes, pay a duty to the Company of one rupee (1*s.* 10*d.*) each tree per year.

At Cuddalore there are five sugar houses, the principal of which belongs to Viney and Cardoza of Pondicherry. Their plan is to dissolve the jaggary in water over a fire, at the same time mixing chunam, to check fermentation, with it; after this it is strained through a filter of animal charcoal, again boiled, and strained through cotton bags. For the purposes of clarifying, they use eggs and chunam. When the syrup is of a proper consistence, it is put into wooden or earthen coolers, and the molasses allowed to drain off. To whiten it as much as possible, rum, or sometimes a fine syrup, is poured over the sugar whilst in the coolers; it is then exposed to the sun to dry, and lastly packed in gunny bags for exportation. It is never mixed with cane sugar. The sugar thus produced, I have no doubt, will eventually supercede the cane sugar. It can be manufactured at a less cost, and the palms affording it grow in abundance in all parts of the tropics, in a dry sandy soil, which would produce nothing else of value. They require very little cultivation—merely enough to keep the luxuriant vegetation from springing up into a jungle around them, and to remove the numerous parasitical plants from their stems. Of course the sugar will improve in quality when more experience has been gained in the way of making it—the oldest factory having been established only five years. The quantity produced I should think was about six thousand tons last year. The molasses are at present of little or no value in the English market, but two of the houses at Cuddalore,

are making rum of it, a sample of which came to England this winter.

The Palmyra and cocoa palms grow to the height of 100 feet or more, in eight or nine years, and the latter variety will for many years yield 500 nuts per annum, a succession of fruit being produced on the same tree throughout the year; the Palmyra palm leaves are used for writing purposes by the natives, they scratch the letters on the leaf with a style.

Were the French colonists at Pondicherry to manufacture sugar in their own territory, they would not be allowed to import it into France. By a treaty between them and the East India Company, they abstain from manufacturing opium and salt, in consideration of which they are paid by the Company a sum of money, sufficient to defray the expenses of government both at Pondicherry and Bourbon. However, the settlers would prefer being under the rule of the British, as they consider their commerce would be benefitted by it. *Pharm. Jour.*

ART. XI—ON THE ORIGIN OF SAMOVY ISINGLASS.

By Dr. Pereira, F. R. S.

Among the numerous kinds of isinglass known in English commerce, there is one which is well known by the name of *samovy isinglass.* It is imported from Russia in three forms, viz, as *leaf, book* and *short staple,* and is in considerable demand among brewers for making finings.

Some doubt has hitherto existed as to its origin. In the last edition of the *Elements of Materia Medica*, I stated two reasons for believing that it was the produce of the fish

called by naturalists the *Silurus glanis*, these were, first, that the Russian name of this fish was *som*, a term from which the word *samovy* or *somovy* might possibly be derived. Secondly, that according to Martius, from this fish are obtained, leaf, book, and staple isinglass, the three forms in which samovy isinglass occurs in English commerce.

Mr. Faber was kind enough to enquire, at my suggestion, of his Russian correspondents whether this opinion was well founded or otherwise, and I have recently received the following communication from him on the subject: "I have ascertained," he says, "from some of my Russian friends, that what you supposed, is quite correct, viz., that the samovy isinglass comes from the Russian fish *som*. The Russians, having no article, make an adjective of *som* by adding *ovy*, and then pronounce it *samovy*, although *they* spell it *somovy*." *Pharm. Jour.*

ART. XII.—EXAMINATION OF THE VOLATILE ACIDS IN VIBURNUM OPULUS.

By L. von Monro.

Chevreul found in the berries of *Viburnum Opulus* phocenic acid, the identity of which with valerianic acid has been proved by Dumas. Krämer has submitted the bark of *Viburnum Opulus* to examination, and considers the volatile acid obtained from it, as well as its salts, not to be identical with valerianic acid from their external properties. The author was induced to repeat this investigation.

The bark of young trees of *Viburnum* was peeled off in spring, carefully comminuted, and submitted to distillation

with water to which some sulphuric acid had been added. 4 lbs. of bark yielded 40 quarts of acid liquid. The distillate was saturated with carbonate of soda and evaporated, when an oil having the odour of *Viburnum* volatilized. The concentrated liquid was again distilled with sulphuric acid to obtain the pure acid; it separated partly in oily drops on the surface of the distillate, and was partly dissolved in it. The drops of oil had the peculiar and strong odour of cheese, as well as the other properties of valerianic acid; the barytic and zinc salts crystalliized from the hot solution in pearly laminæ, the silver salt in fine dendritic crystals. The entire distillate was saturated with ammonia and treated with nitrate of silver; it yielded a beautiful white light crystalline precipitate. This precipitate when boiled became black, probably from a small quantity of formic acid which had been formed, but beautifully white crystals separated from the filtered liquid. The first salt which crystallized was that of the volatile acid of *Viburnum Opulus*, viz. valerianate of silver; the salt which separated from the mother-ley was pure acetate of silver.

The valerinnate was readily separated from the acetate by recrystallization, owing to its sparing solubility. On analysis it yielded—

Carbon, - -	28·65	10 =	750·0	28.69
Hydrogen, -	4·33	9	112·5	4·30
Oxygen, - -	11·55	3	300·0	11·47
Silver, - -	55·47	1	1451·6	55·54

The acid discovered by Chevreul in the berries of *Viburnum Opulus* consequently occurs likewise in the bark; and the acid considered as distinct by Krämer is identical with valerianic acid.—*Chem. Gaz. from Ann. der Chem. und Pharm.*

ART. XIII.—A SIMPLE METHOD FOR PREPARING THE PURE SULPHATE OF MANGANIUM FROM THE NATIVE PEROXIDE.

By Mr. Reuben Phillips.

The native peroxide of manganinm is to be pulverised and suspended in water, through which a stream of sulphurous acid gas is to be passed. The same arrangement of apparatus may be used, as would be employed were it designed to generate the hyposulphate of manganium; with this exception, that, there is no occasion for keeping the water containing the peroxide of manganium cool. The sulphurous acid, generated from sulphuric acid, should be made to traverse some vessel containing water, to condense any sulphuric acid which may be suspended in the gas, and also to remove from the gas any hydrochloric acid gas, which may be simultaneously liberated with the sulphurous acid; when the commercial sulphuric acid is used, I send the sulphurous acid through a U tube containing fragments of pumice-stone, which are saturated with water; and I also put some water in the tube, so that the gas may bubble through a verticle inch or two of water. The sulphurous acid is then conveyed into a two-necked bottle, containing the oxide of manganium suspended in water; and through the other neck of the bottle, a stirrer is inserted to prevent the oxide from subsiding.

The sulphurous acid becomes rapidly absorbed in the two-necked bottle, producing the sulphate and hyposulphate of manganium; to transform which latter salt into the sulphate of manganium, the contents of the two-necked bottle is to be transferred to a porcelain vessel, in which it can be boiled for about half an hour; at the end of which time, the hyposulphate will be very nearly decomposed; an excess of

the peroxide of manganium should be used, which entirely prevents the evolution of sulphurous acid during the ebullition. The solution is now to be filtered, and evaporated to dryness; after which it may be gently heated until no more sulphurous acid is disengaged.

The salt thus obtained is very nearly white, possessing a scarcely perceptible rose tint. As I have obtained it, it has a slight acid re-action; this, if required, can be rectified by a second solution, and the addition of a small quantity of carbonate of baryta. The salt contains no metal but manganium. I find the best test for a persalt of iron in a manganium salt to be the sulphocyanide of potassium.—*Lond. Chemist.*

ART. XIV.—ON POTATO SUGAR.

By Mr. John A. Spencer.

Wishing a short time since to prepare a specimen of grape sugar from potato starch, and not feeling satisfied with the product obtained by the use of oil of vitriol, in consequence of the sulphate of lime retained in solution, it struck me that if I used an acid whose lime-salt was more insoluble than the sulphate, the product would be improved; I therefore used oxalic acid, and was not disappointed in my expectation.

Four parts of potato starch, twenty parts of water, and one part of oxalic acid, dissolved in water, were boiled together, and in less than ten minutes the mixture, from being so thick, that the vessel which contained it might have been inverted for a few moments without risk of loss, became as thin and limpid as water; the boiling was con-

tinued until a small portion of the liquid, neutralized with chalk and filtered, gave no precipitate with a solution of diacetate of lead, which occupies in general from five to six hours.

The liquid was then neutralized with chalk, boiled and filtered—the filtered solution digested with animal charcoal to deprive it of what little colour it had acquired, again filtered, and the washings of the charcoal added to the solution, which was then evaporated in a water-bath to the consistence of honey, and placed in a warm situation for three or four days, when the whole solidified into a crystalline mass of grape sugar, having a perfectly sweet taste, unaccompanied by any bitterness, while that made with sulphuric acid had a nauseous bitter taste, and crystallized with much greater difficulty.

In addition to the superiority of the product obtained by this process, we have the great advantage of being able to ascertain when the whole of the starch has been converted into sugar, by its giving no precipitate with a solution of diacetate of lead, which shows that the dextrine, into which the starch is first converted has undergone its complete change, and enables us to avoid unnecessary boiling, which destroys its tendency to crystallize, an advantage not afforded by the use of sulphuric acid, because the sulphate of lime retained in solution (however small in quantity) precipitates sulphate of lead, which, though very different in appearance to the compound of gum and oxide of lead, might be mistaken for it in small quantities.

Since adopting the above process, I find that Mr. Graham, in his *Elements*, suggests the use of 1-200th part of oxalic acid, but I have not been able to succeed with anything like so small a quantity.

A mixture, in the proportions prescribed by Mr. Graham, was boiled for fourteen hours and a half; but the liquid, though much discoloured, was not even made limpid, far

less was its property of forming the blue compound, with a solution of iodine, destroyed.

If in time the starch should be converted into sugar, I think its tendency to crystallize would be completely destroyed by the long boiling required.—*Pharm. Journ.*

ART. XV.—MEDICAL PROPERTIES OF THE FEVILLEA CORDIFOLIA.

By W. Hamilton, M. D., Plymouth.

Among the other indigenous productions of our West Indian colonies, which the superior attractions of the cane have hitherto kept in unmerited obscurity, the Fevillea cordifolia, or Antidote Coccoon,* claims a prominent place from the value of its medicinal properties.

This is a climbing plant, frequent in waste lands and on the skirts of woods, covering the trees and bushes like ivy, and producing small yellow flowers, which are succeeded by a hard three-celled pome, resembling a calabash, and inclosing about a dozen large round compressed seeds, which, on attaining maturity, drop out through a circular opening in the fruit. These seeds are known by the name of coccoons, and, from the quantity of oil which they contain, are employed by the negroes as a substitute for candles; a number being stuck for this purpose on a long skewer, and the uppermost coccoon ignited.

The whole plant abounds in a bitter principle, which might, no doubt, be advantageously substituted for some

*This production was briefly noticed in vol. xv., page 236 of this Journal. Our readers will now have an opportunity of being further acquainted with its history.—*Ed. Am. Journ. Phnrm.*

of the more costly bitters of the shops; and this bitter principle obtained, in the present improved state of chemical science, in a detached and portable form. Popular opinion accords to the plant itself the merit of being antisyphilitic, emmenagogue, and stomachic. But the bitter principle which pervades all the other parts of the plant, presents itself in a still more concentrated form in the seeds or coccoons, which have, in consequence, been chiefly, if not exclusively, employed in the rude practice of our colonies.

Such is the estimation in which they are held by the Spanish inhabitants of South America, to whom they are known by the name of *avila*, or *avilla*, that they are reputed by them to be worth their weight in gold; and in Brazil, the oil obtained from them by expression is regarded as a sovereign remedy for those rheumatic pains which result from exposure to the cold and dews of night.

The tincture is prepared by macerating eight or ten of these coccoons, scraped and bruised fine in a mortar, in a pint of spirit for two or three days, shaking the bottle containing them frequently, and diluting the tincture with an equal quantity of water. This tincture, in doses of a tablespoonful, is a good stomachic, and counteracts the effects of poisonous fish. According to a numerous series of experiments made by Mr. Drapier, of which an account may be found in the nineteenth number of the *Quarterly Journal of Science*, p. 192, these coccoons are most powerful antidotes to vegetable poisons; and he has found their external application to poisoned wounds equally efficacious.

Of the efficacy of the tincture, prepared in the manner just mentioned, as a hydragogue in the cure of anasarca, a striking case was communicated to the *Columbian Magazine*, for July, 1798, by a gentleman who had an opportunity of witnessing its effect upon a female domestic of his own, who had, as he informs us, "been pronounced by the medical gentlemen in Spanish Town, in a dropsical state, and every thing administered that they thought necessary

in such a case, but all in vain; for, on my subsequent removal to Kingston, I found the swelling much increased in her face, legs, and thighs, with a puffiness in her belly. A planter, from Above Rocks, breakfasted with me; I called the girl to get some water; he was alarmed on seeing her condition, and advised the use of the coccoon or antidote, observing that he had made a perfect cure of a girl in the same state. I proceeded according to his directions, and with the like success; it is now eighteen months since, and thanks be to God she is now in perfect health. I therefore think myself bound to publish the same for the benefit of my fellow creatures."

Such is the unvarnished narrative of the anonymous correspondent of the magazine, which is not the less entitled to consideration, because it comes unsanctioned by the impress of professional authority, and unauthenticated by the celebrity of a name. To the medical reader, the omission of the manner of exhibition is immaterial, since his own experience and judgment in similar cases must be sufficient to guide him, while his professional caution will secure him against the danger of its rash administration.

It becomes, however, worth the trouble of enquiry to determine upon what the hydragogue action of the coccoons depends, and whether the active constituent does not admit of being obtained apart from the rest. By the aid of Chemistry, modern practice is enabled, in most cases, to reduce the bulk, while it augments the activity of the dose. This is especially manifested in the cases of cinchona and opium—in both of which art has succeeded in detaching the active principle from its inert or noxious adjuncts, and presenting it to the patient in a form, if not attractive, at least exciting the smallest possible amount of disgust.

Taken to a larger extent than that mentioned, the tincture operates as an emetic and a purgative. In dropsical cases a wineglassful should be taken every morning fasting, and followed by moderate exercise before breakfast. An in-

fusion in Madeira wine is also a good stomachic. The expressed oil of the coccoon is good for burning, and may perhaps prove useful as an internal remedy in the same cases in which the tincture has been recommended; and from partaking of the same bitter taste with the seeds, it is probable that the same active principle may be found to pervade the whole plant.—*Pharm. Journ.*

ART. XVI.—NOTICES OF SOME RARE KINDS OF RHUBARB WHICH HAVE RECENTLY APPEARED IN ENGLISH COMMERCE.

By Jonathan Pereira, M. D., F. R. S.

In laying before the scientific Committee of this Society* some observations on several kinds of rhubarb, not frequently met with in English commerce, I take this opportunity of stating, that I am indebted for the specimens to Mr. Faber, who has on this, as well as on several other occasions, very kindly aided my inquiries, in Pharmacological Natural History, by specimens and commercial information of an interesting and useful kind.

I propose this evening to draw the attention of the Committee to four kinds of rhubarb, which are respectively denominated *Canton stick rhubarb*, *Bucharian rhubarb*, *Siberian rhubarb*, and *Himalayan rhubarb.*

1. *Canton Stick Rhubarb.*

Two kinds of rhubarb it is well known, are imported from Canton, the one called *China, East India*, or *half-trimmed rhubarb;* the other termed *trimmed, Dutch-trimmed*, or *entirely-trimmed rhubarb.*

* London Pharmaceutical Journal.

I have recently met with a third sort, corresponding with neither of the kinds just alluded to, and which, on account of its resemblance to the English stick variety, I shall call *Canton stick rhubarb*. It is only recently that this sort has appeared in the market. Five cases of it were imported from Canton, and were sold during the last year by public sale, at eight pence per pound.

All the pieces but one of my sample, are cylindrical, about two inches long, from half to three quarters of an inch in diameter, and weigh each on the average about 100 grains. The piece to which I have referred as forming the exception, is shaped like a flattened cylinder, cut obliquely at one end; its greatest length is about two and a half inches, its greatest breadth two inches and a quarter, while its depth is about one inch, and its weight is about two ounces. Mr. Faber, from whom I received it, tells me, that on the examination of a quantity of Canton stick rhubarb, he found several such pieces.

Most of the pieces are decorticated. These resemble English stick rhubarb in their texture and colour, except that they are, perhaps, somewhat paler, the taste is bitter, and somewhat astringent, but considerably less so than that of good, half-trimmed, Canton rhubarb. By chewing it, little or no grittiness is perceptible.

This kind of rhubarb is probably obtained from the root branches of the plant which yields the usual Canton rhubarb.

2. *Bucharian Rhubarb.*

By most writers the term Bucharian rhubarb is employed synonymously with that of Russian rhubarb. But there has long been known in Russian commerce a rhubarb called Bucharian, which is not under the control of the crown, and which, on account of its cheapness, is used in veterinary medicine. Grassmann, an apothecary at St. Petersburgh, considers it to be the rhubarb which, according to Pallas, is obtained from *Rheum undulatum*, and which, in the

Pharmacopeia Rossica, for 1798, was denominated *Radix Rharbarbi sibirici*.

I have received from Mr. Faber a sample of a rhubarb which was sent to him in 1840 by a first-rate drug-house at St. Petersburgh, under the name of *Bucharian rhubarb*, and which, he has been subsequently assured, is the genuine Bucharian kind. Some friends of his at Vienna have written to him respecting it as follows: "We now very seldom see Bucharian rhubarb. It used formerly to be brought by Jews into Brody (Gallicia) by the way of Russia, and the Jews of Brody used to supply Germans with it. But the quality being very inferior, and not better than European rhubarb, it did not probably answer."

This kind of rhubarb is intermediate, between the Chinese and Russian or Muscovite rhubarb, but is of inferior quality. The pieces are, more or less, rounded or flattened, and weigh from one to two ounces each. Some of them appear to have been deprived of their cortical portion by scraping, as in the Chinese rhubarb; but in others the cortex has been removed by slicing. Most of them are perforated by a hole apparently for the purpose of drying them; but in none of the holes are there any remains of the cord used in suspending the roots. The holes, moreover, appear to have been cleaned out, as in the Russian rhubarb, for no portion of decayed rhubarb is seen in them. Some of the pieces are dense, but most of them are lighter than good Russian rhubarb. Internally, they are often decayed and dark coloured. Their texture is similar to that of genuine rhubarb. The odour also is like that of rhubarb, but much feebler; the taste is bitter and astringent. When chewed, this rhubarb feels gritty under the teeth. Its colour is darker than that of good Russian rhubarb.

Altogether its resemblance is sufficiently great to the Russian rhubarb to induce me to believe that it, like the latter, is really the growth of the same part of Asia, and probably of the same plant. Calau, an Apothecary in the

rhubarb factory at Kiachta, says, that the Russian merchants barter with the Bucharians for rhubarb in the custom house at Kiachta, but that the selection of the crown rhubarb is conducted in a house appropriated for that purpose on the Chinese borders. Now, as all the rhubarb offered to the agents of the Russian crown must be burnt without remuneration, if not approved of, it is tolerably evident that the Bucharians will offer, for the most part, such kinds only as are likely to pass examination. The inferior sorts, therefore, must be got rid of by some other channels, namely, by private barter or sale. This is the origin, I suspect, of the Bucharian rhubarb which I have met with.

Grassmann, in his account of the varieties of rhubarb found in Russian commerce, describes Bucharian rhubarb as being darker than the ordinary kind. "It occurs," he says, "in heavy, roundish, knobby, perforated pieces, weighing seven or eight ounces each, of a more or less ochre yellow or brownish colour. Its texture is the same as that of genuine rhubarb, its odour strong, its taste bitterish, astringent, and at the same time mucilaginous; when chewed, it feels gritty under the teeth. The older pieces are often hollow and rotten internally. The younger pieces have the same shape as the true rhubarb, but they fetch only one third the price of the Chinese root."

3. *Siberian Rhubarb.*

Through the kindness of Mr. Faber, I have also received specimens of another kind of rhubarb, recently sent by another first-rate drug-house at St. Petersburgh to this country, under the name of *Bucharian rhubarb;* but it differs altogether in external appearance from the preceding sort. Three chests of it, the whole quantity imported, arrived in this country in January last, and were sold by public sale on the 27th of February, at sixpence per pound. It is believed that it was bought for exportation.

This rhubarb was packed in the same kind of chests as those in which the Russian rhubarb is usually imported.

I have reason to believe, however, that it is not Bucharian rhubarb; but is the root known in Russian commerce, as *Siberian rhubarb*, and is probably the rhubarb which Grassman calls *Siberian rhapontic root*. Mr. Faber tells me, that, on receiving it, he immediately wrote to the party at St. Petersburgh, who, in 1840, had sent, under the name Bucharian rhubarb, to this country, the rhubarb which I have above described as Bucharian, and described to him the quality of these three chests. The answer was as follows:—"I have no doubt from your description, that those three chests are Siberian rhubarb, sent under another name for objects of secrecy."

Grassmann describes what he terms *Siberian rhapontic root*, as being very readily distinguishable from genuine rhubarb. He says, that it occurs in long, thin, almost cylindrical or spindle-shaped pieces, which have been decorticated and perforated by a hole. Their colour, externally, is pale yellow, internally brownish yellow, or reddish white. Their odour and taste are those of rhubarb but weaker; and though bitter it has but little astringency. When chewed it does not feel gritty.

This description applies, in the main, to the rhubarb imported this year from St. Petersburgh as Bucharian, but which I shall describe as Siberian. In its general appearance it agrees with the rhubarb grown in this country, and known as English stick rhubarb. It has been decorticated, though imperfectly so, as portions of the dark brown cortex are here and there left adherent. The pieces are all more or less cylindrical, seldom exceeding four inches in length and an inch in diameter, and on the average weigh about 100 grains each; the longest piece I have seen is six inches in length and an inch and a half in diameter. The broadest piece is somewhat flattened and about three inches in its broadest diameter. Its colour is in general darker than that of the ordinary rhubarb, but is of the same kind

of tint. Its odour is remarkably sweet, similar to what I have perceived when drying the roots of different species of Rheum cultivated in England. When chewed it is not gritty. Its taste is mucilaginous, bitterish, but not astringent. The fracture of the smaller and sound pieces is similar to that of English stick rhubarb; the larger pieces are decayed, dark brown, rotten, and tasteless in the centre.

4. *Himalayan Rhubarb.*

In November, 1840, when China rhubarb was very scarce and dear, nineteen chests of Himalayan rhubarb were imported from Calcutta into this country. The chests were of the usual Calcutta kind, made of the hard, heavy, brittle Bengal wood. The weight per chest was gross 1 cwt. 2 qrs. 26 lbs.

Soon after their importation eight chests were bought and shipped to the Italian markets at 4*d.* per lb.; but finding there no buyers, the residue of the importation remained on hand until September last (though in the mean time the duty was reduced from 1*s.* to 3*d.* per lb.) when a sale for shipment to New York was forced at 1*d.* per lb., covering only part of the rent and nothing more.

Four Himalayan species of *Rheum* are mentioned by my friend Dr. Royle, in his *Illustrations of the Botany of the Himalayan Mountains*, namely *Rheum Emodi*, of Wallich; *R. Webbianum*, *R. spiciforme*, and *R. Moorcroftianum*. Dr. Royle states, that the Himalayan rhubarb, which makes its way into the plains of India, through Khalsee, Almora, and Butan, is probably, from its usual dark colour and spongy texture, the produce of either or both *R. Emodi* and *R. Webbianum;* the roots of *R. spiciforme* and *R. Moorcroftianum* being lighter coloured and more compact in structure.

In my *Elements of Materia Medica* I have described two varieties of Himalayan rhubarb which I have received, the one from Dr. Wallich, and probably the produce of *R. Emodi;* the other from Dr. Royle, who informed me that

it was obtained from *R. Webbianum*. The former appears to me to agree best with the imported Himalayan rhubarb; indeed, one or two of the pieces of the latter, strongly resemble the sample which I have received from Dr. Wallich.

I have reason to believe that the present is the first shipment of Himalayan rhubarb ever made to this country, and I suspect that the discouraging result will prevent, for the present at least, any further attempts to introduce it—its quality being very inferior, and unfitted for the English market.

The pieces of it vary considerably in size and shape; some are twisted, cylindrical, furrowed pieces, cut obliquely at the extremities, about four inches long, and an inch and a half in diameter. Others are circular disks, about three inches in diameter, two inches thick, and weighing about four ounces each. Besides these, semi-cylindrical, angular and other-shaped pieces are met with; and are obviously obtained by slicing the root. Some of the pieces are decorticated, while others are coated. The general colour is dark brown; the prominent decorticated and paler parts having an ochre brown tint. It has a feeble rhubarb odour, and a bitter astringent taste. When broken, it does not present the marbled texture characteristic of ordinary rhubarb. By chewing it, little or no grittiness is perceived. It is exceedingly light, and is rendered much more so than it probably is in its perfect form, by the porosity which it has acquired from being worm-eaten.—*Pharm. Jour.*

ART. XVII.—ON THE STATE OF PHARMACY IN MEXICO.

In the 13th Number of Travels and Descriptions of Countries, by Widenmann and Hauff-Cotta (1837, p. 67,) are contained, a few observations on the State of Medicine in Mexico. In reading these through, and more especially in perusing the description of the proceedings of the government against quacks and unlicensed vendors of Medicines, every honest Pharmaceutist must wish to see this class of men treated in the same way in every other country as in Mexico.

The medical authorities in Mexico, are annexed to the Ministère de l'Intérieure. The *Protomedicat*, as it is termed, consists of a President, a Dean, a Fiscal, and five members, all Doctors of Medicine, with a secretary and an usher.

Their duties consist in superintending the examinations in Medicine; in the inspection of the conduct of all medical men; to see that they confine themselves to the legal limits of their profession; in the direction of medical studies; in the inspection or visitation of the Apothecaries' shops; in the direction of the Medico-political measures in case of epidemics; in putting the laws into execution against quacks and unlicensed vendors of medicines of every description, who are to be rigidly prosecuted, and, in case of conviction, punished with fines, banishment, or imprisonment with hard labour;* lastly, in sending in monthly reports of the state of health of the previous month to the government, the reports being themselves founded on the observations and notes to be forwarded by all medical men in actual practice to the Protomedicat on this subject.

The Medical men are arranged under the usual heads of Physicians and Surgeons, (the two classes being rigidly distinct,) Accoucheurs and Apothecaries.

* A plan which would answer very well in all other countries.

Physicians must be graduated Doctors of Medicine, but before they are permitted to practice, they must pass an examination (state examination) before the Protomedicat. If they are found duly qualified, they are bound by their oath to act in every case according to the best of their abilities and their consciences; to abstain from the performance of all surgical operations, unless they have passed the examination in surgery also, and not to prepare or dispense* medicines, much less to keep an apothecary's shop; further, not to take their own relations—even the most distant—under their treatment, to attend the poor gratis, to be content with moderate remuneration from the rich; and lastly, to promote the fulfilment of all religious duties on the bed of sickness and death, or they subject themselves to a fine of 10,000 maravedis (about forty piastres) for each case, in which one of their patients, by their neglect, dies without having received the sacrament. The law holds them, moreover, responsible for every culpable neglect of the duties of their profession.

The apothecaries are, in the first place by law, subjected to a rigid examination, and then to a periodical visitation of their shops, beyond the precincts of which no medicines are allowed to be prepared.

They are bound to reject all prescriptions not signed by a legal practitioner, to abstain from all medical and surgical practice, and never to quit their shops without leaving an approved and duly qualified substitute.

All their assistants must be acquainted with Latin, and capable of compounding medicines accurately and quickly, according to prescription and the directions of the Spanish Pharmacopœia. No one is permitted to open a shop or to take one, in a place where his father or father-in law, son or son-in-law are established in medical or surgical practice.—*Chem. Gazette, from Correspondenz-Blatt für Süd-Deutschland.*

*Then there are no dispensaries in Mexico! Happy land.

ART. XVIII.—FALLACY OF DR. BIRKBECK NEVINS' TEST FOR ASCERTAINING THE PURITY OF DISULPHATE OF QUININE.—By G. M. Mowbray.

The following test has been suggested by Dr. Birkbeck Nevins, as appropriate for readily ascertaining the purity of disulphate of quinine.

"To one or two grains of the suspected salt add three or four drops of sulphuric acid in a white evaporating dish and twice as many drops of water; if the salt contains either starch or fatty matters they will remain, whilst if they are absent the whole will be dissolved. Let heat be next applied to the solution, and as it becomes concentrated, the acid will char any sugar which may be present, which will be indicated by a black stain round the edge of the solution, and the whole will speedily assume the same color."

Allow me to submit, that this test is valueless, and for the following reasons: Dr. Nevins appears to have overlooked a fact well known to chemists whose investigations have been directed to organic compounds, that salts may be readily recognised as belonging either to the organic or inorganic class, by heating on platina: if the compound under examination, after heating, yield a carbonaceous residue, then it belongs to the former class; if a whitish ash be left after ignition, then an inorganic compound has been acted upon. Now, Dr. Nevins directs us to add sulphuric acid to the disulphate; the effect of this is to convert the salt into the soluble sulphate, and on the application of heat, this soluble sulphate, in common with all organic salts, is decomposed, yielding a carbonaceous residue.

Could Dr. Nevins have shown, that which is opposed to all experimental results with organic compounds, that in the presence of sulphuric acid quinine is not readily carbonized—and the reverse of this is the fact, as may readily be ascertained by heating a crystal of the soluble sulphate by the side of a sample of quinine purposely adulterated with sugar or gum—his test might be so far admissible; but as Dr. Nevins has not shown this, and it cannot be shown withal, therefore his test is fallacious.—*Med. Gazette.*

MISCELLANY.

Chemical Examination of several species of Meloe. By J. Lavini and M. Sobrero.—The fluid which the several species of *Meloe* excrete when touched has, as is well known, a similar effect to cantharides. It has long been the custom to submit the living animals to pressure in Sardinia, and to employ the expressed fluid when mixed with fat to form an epispastic ointment.

The authors exhausted the coarse powder of several species which occur in Piedmont (*M. violaceus, M. autumnalis, M. Fucia, M. punctatus, M. variegatus, M. scabrosus, and M. majalis,*) first with boiling water, and then with alcohol and æther. The aqueous solution, which possessed acrid properties, was evaporated to the consistence of a thin extract, and then treated with æther. The solution was colourless, and deposited on spontaneous evaporation white prismatic crystals, which were identical with cantharidine. When pure, they were insoluble in water, soluble in æther, especially when boiling, in alcohol, sulphuric acid, nitric acid, solution of potash, but insoluble in muriatic acid. They also dissolved in acetic acid, especially on the application of heat, a property which likewise belongs to cantharidine. They fuse, when heated on platinum foil to 410°, giving off white vapours; at a higher temperature they are decomposed and burn with a white flame, leaving a readily combustible cinder. The analysis yielded 61·77 per cent. carbon, 6·30 hydrogen, and 32·53 oxygen, results which agree sufficiently with those of Regnault, obtained in the analysis of cantharidine.

The powder which had been exhausted with water, and from which the æthereal extract had been obtained, yielded a small quantity more cantharidine, a green oil easily soluble in alcohol and æther, which possessed acid properties, expelled carbonic acid from the alkaline carbonates, and formed soaps with them; moreover, a yellow oil, soluble in æther, but almost insoluble in alcohol; and finally a white volatile substance, crystallizing in warty masses and soluble in very dilute alcohol. When the substance which had been treated with æther was extracted with alcohol, it yielded mere traces of the substances soluble in æther, already mentioned.—*Chem. Gaz. from Journ. de Pharm. et de Chim.*

On Tamarinds (Tamarchinti.) By X. Landerer, of Athens.—Every Pharmaceutist knows that the tamarind pulp of commerce is contained in a broad pod of the length of a finger, with three or six indenta-

tions. These pods are opened in Arabia, the native country of the tamarind tree; the pulp is there removed, trodden down in a kind of wooden tub, and afterwards formed into roundish cakes, weighing from fourteen to sixteen ounces, and dried in the sun. In this state it is brought to Cairo, where it is sold, the trade not being a monopoly of the viceroy. Even in Egypt all the pulp sold in cake is regarded as adulterated, so that the higher classes purchase only the unopened pods for use. The quantity of tamarind pulp brought into the market of Cairo and Alexandria, varies from 8 to 10,000 cwt., reckoning the cwt. at 36 okkas.—*Pharm. Journ. from Rep. für die Pharm.*

On Senna. By X. Landerer, of Athens.—The senna plant is chiefly indigenous in Ethiopia, Arabia Felix, Abyssinia, Nubia, and Sennaar. The Arab tribes who occupy themselves with this branch of commerce pay not the slightest attention to the cultivation or management of the plants. The senna plant attains the height of eight or ten feet, and affords some protection against the heat of the sun to the inhabitants of the desert and to the caravans. The harvest of senna begins about the end of September. The Arabs then cut nearly all the branches off the tree, leaving the stems bare, and allow them to lie exposed until the leaves begin to fade. The branches are now collected in bundles and exposed on high ground or rocks that the air and sun may dry them as quickly as possible. When the leaves are dry the branches are laid in heaps and beaten with sticks to shake the leaves off. The leaves obtained by this process are not damaged, and consequently fetch the highest price, amounting to about double the sum given in the bazaars for the broken senna. As all the leaves are not separated from the twigs by this process, the branches are, in some parts of Nubia, placed on a clay floor and camels are driven over them to effect the total separation of the leaves, which are by these means broken into pieces and found mixed with small portions of the twigs.

Another variety of senna, characterised by the large size of the leaves and their green colour, is brought from the interior of Africa. It is sold at a high price by the name of *Mekka senna*.

The senna (*sinamiki*) collected in various parts of Africa, is packed in linen sacks on camels and conveyed by caravans to the shores of the Nile, where it is transferred to the boats, and thus brought to Cairo and Alexandria. In these two capitals there are sinamiki magazines, to which the bales are conveyed to be unpacked and again carefully sorted.

Within the last two years the senna trade has been thrown open, but it has latterly again become a government monopoly. The refuse and

dust generated by the sorting of the leaves is not met with in the European markets, as it is kept for home consumption. An intentional adulteration of senna with other leaves in their native country is out of the question, for the slightest adulteration is there punished as a capital crime. The small pods, which are rarely found mixed with the leaves because they are carefully picked out, are in very general use in the countries where the senna grows. In the bazaars of Constantinople and Smyrna two varieties are met with—an Egyptian and a Tripolitan variety.—*Ibid.*

Transparency of Quicksilver.—M. Melsens has found that quicksilver in minute globules is transparent, and transmits a blue light slightly tinged with violet. These globules are formed when a fine stream of water is dropped on a mercury-bath; the drops of water, in consequence of falling with some force, become covered with a thin pellicle of mercury, which present the fact here stated. The result has been verified by Aragc.—*Chem. Gaz., from L'Institut.*

Experiments on the Milky Sap of the Cow-Tree. By Heintz.—It is now a considerable time since the milky sap of the *palo de vaca* was examined by Messrs. Boussingault and Mariano de Rivero, who found it to contain water, wax, a substance identical with animal fibrin, sugar, and a magnesian salt, free from acetic acid.

Since the experiments of these philosophers, M. Solly also made several imperfect experiments on this liquid, according to which he discovered water, a resinous or waxy substance, gum, saline substances, probably acetate of magnesia, gluten and albumen.

Five years ago many experiments on the same subject were published by M. Marchand. This chemist found, in the sap that came from the Caraccas, water, sugar capable of fermentation, lime and magnesia in combination with phosphoric acid, traces of acetic and butyric acids, a substance resembling caoutchouc, and various resinous matters.

We have now before us a statement of new experiments, made by M. Heintz, on different samples of the milk of the cow-tree. According to this author the sap contains 42.7 per cent. of solid substances, that is to say—

Water	57.3
Vegetable albumen	0.4
Waxy matter	5.8
Resinous matter	31.4
Gum and sugar	4.7
Fixed salts	0.4

In a sample of damaged sap, M. Heintz also discovered traces of bu-

tyric acid. The ashes of the sap contained soda and traces of potash, in combination with carbonic and phosphoric acids. In addition to these substances, there were magnesia and a small quantity of lime.

These results are nearly the same as those at which the predecessors of M. Heintz had arrived. This chemist analysed, with much care, all the resinous or waxy substances he found in the sap; but it appears unnecessary for me to give the formulæ he calculated, for they are completely arbitrary, and do not apply to definite compounds.—*Chemist*.

On the Composition of Linseed Oil and its Products, by Oxidation. By Dr. F. Sacc.—The conclusions drawn by Dr. Sacc, from his experiments on linseed oil, are, that this substance consists of *margaric acid* and *oleic acid*, combined in equal equivalents with *acroleine*. By oxidation with nitric acid, we obtain margaric acid, oxalic acid, suberic acid, pimelinic acid, carbonic acid, and water.

The oleic acid of linseed oil differs in composition from the oleic acid of other fatty bodies; the formula of the anhydrous acid is C_{46} H_{38} O_5. The margaric acid of linseed oil is identical with that of other fatty bodies, its composition being C_{34} H_{33} O_3. The glycerine, which is obtained in great quantity from linseed oil, is also similar to that procured from other fats.

By oxidation, the oleic acid yields suberic acid, which again is decomposed into a volatile fatty substance.

The pure margaric acid yields on oxidation succinic acid, but no suberic acid or pimelinic acid.

The pimelinic acid is formed, by a transformation of the suberic acid when succinic acid is present. There exists a peculiar fatty substance of very singular properties, forming the link between the oleic acid and the suberic acid.—*Pharm. Journ. from Ann. der Chem. und Pharm.*

On the Yellow Colour which the Unguentum Iodidi Potassii acquire, by keeping. By Kallhofert.—1. I melted the fat obtained from the viscera of a recently slaughtered pig in vessels of silver, platinum, iron, tin, glass, porcelain, and in glazed earthen vessels, but observed that all the specimens thus prepared bore the same relation to iodide of potassium. All the ointments thus prepared, remained perfectly white during the first four days; but after the lapse of ten days, assumed a yellow colour.

2. Ung. potassii iodidi, when perfectly white, instantly turned yellow on addition of a few drops of the essential oils of lavender, thyme, cloves, and more especially of valerian and cinnamon.

3. Hogslard one ounce, which had been melted about a fortnight previously, gave, with one drachm of iodide of potassium, and six grains of carbonate of magnesia, an ointment which became yellow and puffy whilst it was being rubbed down.

4. I prepared an ointment of one drachm of iodide of potassium, and fifteen grains of carbonate of magnesia, and one ounce of hogslard, melted twenty days previously, and kept in a well-closed pot. In fifteen hours the cap burst, and the ointment was scattered about, appeared yellow, puffy, and woolly, and showed very little activity when applied to sensitive portions of the skin.

5. One drachm of iodide of potassium, 15 grains of levigated chalk, and one ounce of hogslard (melted twenty days previously.) The ointment thus prepared was but slightly discoloured in a fortnight, but appeared to have little activity.

6. One drachm of iodide of potassium, four grains of potassa fusa, and one ounce of old hogslard. In twenty-seven days this ointment was but slightly discoloured, and is tolerably white at present, three months after its preparation.

7. ℞ Olei de Cacao
Ceræ Albæ
Ol. Amygd. *ana* ℥ss.
Potassii Iodidi, ℈iv.
Boracis Venet.
Aq. Destill. *ana* ℈j.
Ol. Rosar. gtt ij. M. ft. Ung.

This ointment is now at three months from the date of preparation unchanged.

8. ℞ Cetacei, ℥ss.
Ol. Olivæ ʒvi.
Ceræ Albæ ʒij.
Potassii Iodidi, ℈iv.
Ol. Citri.
Ol. Rosar. *ana* gtt iij. M. ft. Ung.

Is at present, three months since it was made, not perceptibly yellow.—*Pharm. Journ. from Pharm. Central Blatt.*

Adulteration of Iodine.—M. Herberger draws attention to the fact that with the present high price of iodine sophistications are uncommonly frequent. Thus he found in one sample native sulphuret of antimony. But the adulteration with artificial graphite is far more deceptive; it may, however, be readily detected by driving off the iodine at a gentle heat, and subsequently raising the temperature with access of air.

In one instance the author found no less than 51 per cent. of graphite.—*Ib. from Jahrb. für Prakt. Pharm.*

Pyrophorus from Tartar-emetic.—A very dangerous pyrophorus may be produced by igniting tartar-emetic in a closed crucible. In some experiments to prepare pure antimony in Prof. Wackenroder's laboratory, several ounces of tartar-emetic were submitted to a slight calcination. On emptying the carbonaceous residue, which was still somewhat warm, from the crucible into a dish, it took fire in a few minutes, probably by being breathed upon, and was then suddenly projected about the laboratory, forming a shower of fire.—*Chem. Gaz. from Archiv der Pharm.*

Observations on the Ferrocyanide of Potassium—As the ferrocyanide of potassium is decomposed on ignition, into cyanide of potassium and iron, Liebig has assumed, that on igniting animal charcoal potash and iron, cyanide of potassium alone is formed, and that this is converted into ferrocyanide of potassium on extracting the ash with water. If the finely-powdered fused mass is digested with spirit, but little cyanide of potassium is obtained; on the other hand, on exhausting it with hot water, ferrocyanide of potassium is immediately obtained, and indeed to the same amount as when procured from the ash in the ordinary way. If the formed cyanide of potassium were capable of dissolving iron, the iron extracting-pans ought to be considerably attacked, which however is not the case, as they frequently last more than ten years.—*Ib. from Poggendorff's Annalen.*

On the Preparation of Hyposulphite of Soda. By M. V. Legrip.—The author gives the following as a good and cheap process for the preparation of hyposulphite of soda, now so extensively employed in taking Daguerreotype images:—

Take of	Subcarbonate of soda . . .	730 parts
	Sulphur	45 "
	Water	1500 "

Mix the sulphur first, with a small quantity of the water, and then add the soda dissolved in the remainder of the water. Introduce the mixture into two two-necked bottles, which shall not be more than two-thirds filled, then,

Take of	Clean iron filings	1,500 parts
	Sulphuric acid, (sp. gr. 1.845) . . .	3,000 "

Put these into a flask capable of holding two or three times the above quantity. Allow the mixture to cool, and the first portion of disengaged hydrogen to escape, then place the flask on a sand-bath, and by means

of tubes of rather large diameter, convey the gas, first into a washing bottle, and then through the two-necked bottles containing the solution. The heat applied to the flask should be gradually increased, so as to produce a regular, but not too rapid evolution of gas.

The process having continued thus for ten or twelve hours, may be stopped. The solutions contained in the two bottles are to be mixed together, filtered, and evaporated, so as to yield crystals of hyposulphite of soda.

The flask will contain sulphate of iron, which may be dissolved out and crystallized.—*Pharm. Journ., from Journ. de Chimie Med.*

Note on the Origin of East India Kino.—A communication was read from Dr. Royle with reference to the origin of East India kino. Several conflicting opinions having been expressed by Pharmacologists as to the tree which yields this product, Dr. Royle and also Dr. Pereira have for some time been endeavouring to procure authentic information on the subject. Dr. Royle has at length succeeded in ascertaining, from undeniable evidence, that East India kino is an exudation obtained from the *Peterocarpus marsupium*. He has also received an account of the manner in which it it is collected, which account has been furnished by Mr. J. Brown of Anjara Kandy, on whose estate the whole of the Kino brought to this country is said to be produced.

The substance of the communication was only briefly stated to the meeting, as the paper was intended for the Scientific Committee, and it will therefore be brought forward at a subsequent meeting in a more mature form.—*Ibid.*

Duflos' Method of Purifying Crude Hydrochloric Acid.—MM. Hensler and Riegel have tried this method, and found it to answer well.

Mix fifteen pounds of crude hydrochloric acid with five pounds of water and one ounce of sulphate of iron; expose the mixture to the air for some time, and when clear pour it into a retort, and distil, at a moderate heat, three-fifths or three-fourths.

The product of distillation is clear, colourless, of a proper degree of concentration, and quite pure. In the neck of the retort a yellowish white sublimate will be observed.—*Ibid, from Pharm. Central Blatt.*

On the Portion of Opium which is Insoluble in Cold Water.—By Stanislaus Martin.—It is a very general opinion that water extracts all the active constituents from opium; but M. Martin has observed the residue of opium, which is insoluble in water, if subjected with sugar and yeast

to fermentation, will yield still a very narcotic preparation. He found in the residue remaining in the preparation of the aqueous extract of opium, and of the acetate and muriate of morphia, *brown extractive matter, narcotine, fatty oil, resin, caoutchouc, bassorine,* with *a gum-like substance, sulphate of lime, &c.*, with *vegetable fibre.* One part of this residue of opium, which is insoluble in cold water, was mixed with 175 parts of sugar and 40 parts of yeast, and exposed to a temperature of 77° Fahr. When fermentation had ceased, and the fluid had become clear, it was filtered and evaporated in a water-bath to dryness. The extract was again dissolved in water, and subjected with sugar and yeast again to fermentation, then re-filtered and evaporated. *This fermented extract of opium* is of a brown colour, and has a peculiar aromatic odour and bitter taste, producing a sensation of warmth on the palate. Two centigrammes of this extract produced narcotism with head-ache in a strong man, and in a second experiment vomiting ensued. A dog of moderate size was killed by one gramme = 16 grains. This subject is worthy of further examination.—*Ibid, from Reper. für die Phvrmacie.*